A paper prepared for the

Economic Council of Canada

P.O. Box 527
Ottawa, Ontario
K1P 5V6

Un document préparé pour le

Conseil économique du Canada

C.P. 527
Ottawa (Ontario)
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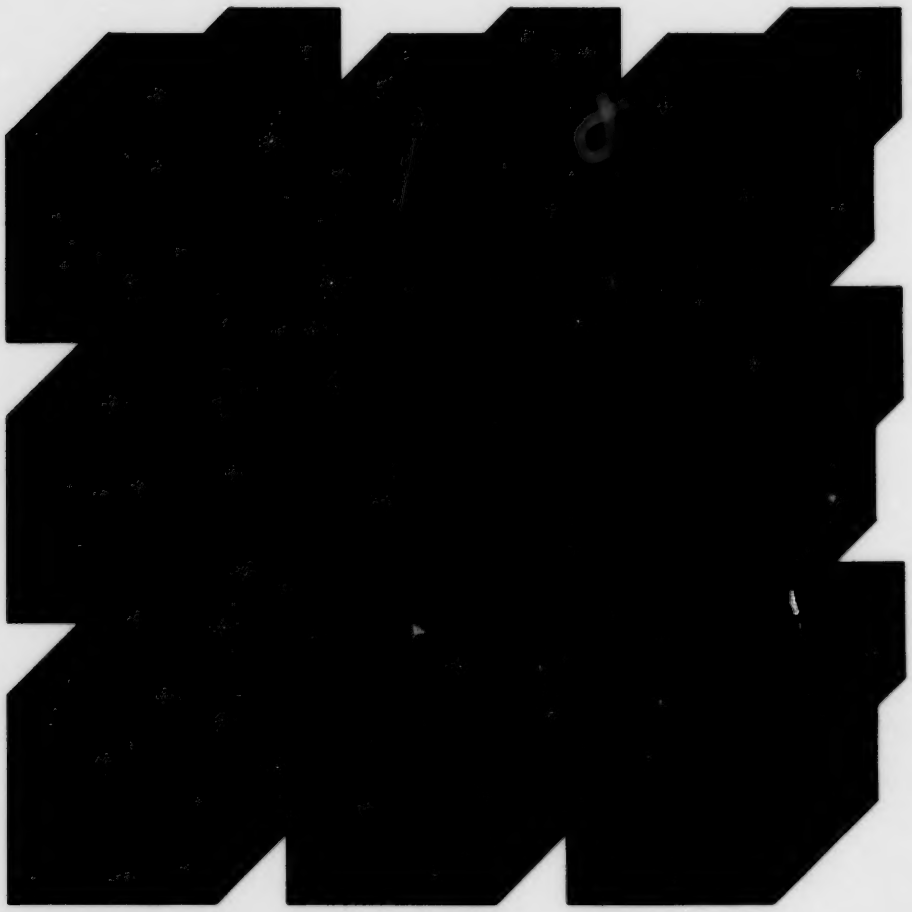

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DISCUSSION PAPER NO. 317

The Economic Effects of the Property Tax: A Survey

by

Paul A. R. Hobson

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ISSN-0225-8013

February 1987

Résumé

L'auteur du présent document passe en revue les ouvrages et articles publiés sur l'incidence économique de l'impôt foncier. Il en examine séparément les effets, sur les plans de la répartition et de la distribution des ressources, pour les industries ou les commerces, et pour le secteur résidentiel. L'économie canadienne étant une économie ouverte, il en tient compte, ainsi que du rôle de l'impôt foncier dans l'ensemble du régime fiscal.

À l'aide d'un modèle global, l'auteur étudie les thèses classiques et nouvelles au sujet de l'incidence de l'impôt foncier. Celle qui assimile cet impôt à des frais versés pour des services est également examinée par l'auteur. Celui-ci montre que l'impôt foncier se classe nettement dans la catégorie des impôts sur le capital, qu'importe l'opinion adoptée. En général, on estime que l'incidence de l'impôt foncier est progressive.

L'auteur analyse aussi les effets de l'impôt foncier sur l'affectation des ressources. L'argument principal invoqué a trait au rôle de second rang de l'impôt foncier sur les propriétés résidentielles, le revenu du capital autre que la rémunération nette qui est imputée au logement occupé par son propriétaire étant déjà assujetti à l'impôt sur le revenu.

M. Hobson soutient que la plupart des critiques au sujet de l'impôt foncier visent son administration plutôt que l'impôt lui-même. Parmi les réformes administratives qu'il recommande, la principale est qu'on adopte le principe de l'évaluation des propriétés à leur pleine valeur marchande, ainsi qu'une structure de taux établissant une corrélation plus étroite entre l'impôt payé et les services obtenus. L'auteur recommande en outre que les services aux personnes, comme les programmes de bien-être et l'enseignement, soient financés par l'impôt sur le revenu et non par l'impôt foncier. Ces arguments tiennent, peu importe qu'une éventuelle modification du régime actuel d'impôt sur le revenu favorise une assiette fiscale plus générale, ou l'assiette fiscale d'un impôt sur les dépenses.

Abstract

This paper is a survey of the literature on the economic effects of the property tax. Both the allocative and the distributive effects of the property tax are discussed. Separate attention is paid to industrial/commercial property taxes and the residential property tax. Consideration is given to the openness of the Canadian economy and the role of the property tax within the overall tax system.

The classical and new views of property tax incidence are examined within a comprehensive model. The benefits view of the property tax is also examined. The property tax is shown to fall squarely within the class of capital taxes regardless of which view is adopted. Generally, the property tax is seen as being progressive in its incidence.

The impact of the property tax on resource allocation is examined. A central argument stems from the second-best role of the residential property tax given the taxation of capital income other than the imputed net return to owner-occupied housing under the income tax.

It is argued that much of the criticism of the property tax is more appropriately applied to the administration of this tax than to the tax itself. Among the administrative reforms that are recommended, the most central is that full market value assessment be adopted and a rate structure established that more closely links taxes paid to benefits received. Also, it is recommended that people related services such as welfare and education be financed from the income tax base rather than the property tax base. These arguments hold regardless of whether the current income tax system is reformed to correspond to a comprehensive income tax base or an expenditure tax base.

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ACKNOWLEDGEMENTS

The author wishes to acknowledge the helpful comments of Jan Brueckner, Jack Jung, France St.-Hilaire, David Sewell, David Wildasin and an anonymous referee at various stages over the course of this project.

FOREWORD

This paper is one of the outputs from Council's three year study of the taxation of capital income -- or of the income derived from savings and investment. The study program had important dimensions in both time and space. The effects of capital taxation on both present and future output and standards of living were scrutinized. Taxes levied by all levels of Canadian government were studied as were the international implications of the taxation of capital income. Another important emphasis in the study program was on the interrelationship among specific measures of capital taxation. Here, general equilibrium and other techniques were used to examine the various measures as an interrelated system. Separate studies were also undertaken of specific measures of capital taxation including the personal and corporate income taxes, sales and transaction taxes, property taxes, and resource taxes.

The present paper surveys the literature on the economic effects of the property tax. Separate attention is paid to industry, commercial and residential taxes, their administration, and their roles within existing and reformed tax systems.

Paul Hobson is a professor of economics at Acadia University. This paper was written while he was a visiting professor at the University of Western Ontario.

Judith Maxwell
Chairman

1. INTRODUCTION

The property tax has been criticized as being vertically inequitable, horizontally inequitable and inefficient. Nonetheless, it remains the primary independent revenue source available to local governments and, as such, would appear to be here to stay. In recent years, there have been attempts made to institute reform of this tax. Also, a burgeoning literature which challenges much of the conventional wisdom concerning this tax has emerged. The objective of this survey is to attempt to link together the various strands of this literature with a view to establishing more precisely the issues that are involved. Only when this has been done can a discussion of property tax reform be meaningfully undertaken.

The significance of the property tax as a component of the overall tax system should not be underestimated. In 1980, this tax yielded $9,791 million in revenues, or 8.1% of revenues generated by all levels of government. By way of comparison, the corporation income tax generated $11,455 million in revenues, of 9.5% of total revenues. Sales taxation generated $11,756 million in revenues, or 9.7% of total revenues.

As a component of local government revenues, property taxes have declined in relative importance during the past twenty years. In part, this reflects the increasing importance of intergovernmental grants and increasing provincial involvement in local government affairs. During this same period, most provinces have undertaken some reform of property tax administration.

Nonetheless, as a percentage of own source revenues, property

taxes constituted approximately 39% in 1980, averaged over all provinces. As a percentage of total local government revenues, own source revenues were approximately 50% in 1980, averaged over all provinces.

There continues to be some confusion over the appropriate classification of the property tax. Recent academic literature firmly establishes the property tax as another form of capital taxation. That is, for the most part, the burden of property taxation is on owners of capital. This contrasts markedly with the conventional view of the property tax as an excise tax that is borne by consumers of goods and services.

This distinction has important implications for both the issue of tax incidence and the issue of the deadweight loss of taxation. It is now recognized that treating the property tax as a tax on capital rather than an excise tax can significantly alter the overall assessment of the existing tax system in terms of both equity and efficiency. Indeed, much of the conventional wisdom concerning the property tax underlying the criticism of this tax can be shown to be wholly misdirected.

The next section provides some further background on the property tax and the issues associated with it. Dealing with these issues in a comprehensive and systematic manner provides the motivation for the paper and is the subject of the remaining sections. In the final section, a summary and a statement of policy recommendations are provided.

2. BACKGROUND AND MOTIVATION

The Tax Base and Determination of Tax Rates

The property tax base is the assessed value of various classes of property. These classes include industrial/commercial property and residential property. Certain classes are exempted from property taxation, including government property, educational property and church property. The value of a given class of property reflects the value of the land and structures embodied in it.

For a given revenue requirement, G, the tax rate is established as the ratio of required revenues to total assessed value, V*. Generally, property tax rates are quoted as mill rates, which are simply taxes per $1,000 of assessed value. The percent rate, t, is given by

$$t = \frac{G}{V^*}$$

The mill rate is given by

$$m = \frac{G}{V^*} \times 1000$$

Thus if the required revenue is $10,000 and total assessed value is $100,000, a tax rate of 10% is indicated which translates into $100 per $1,000 of assessed value.

Since assessment practices may differ from jurisdiction to jurisdiction, it is difficult to compare nominal rates across jurisdictions.[1]

Of interest is a comparison of effective rates across jurisdictions, where the effective rate is the ratio of taxes paid, G, to market value, V. If the relationship between assessed value and market value is given by $V^* = aV$, then the effective tax rate, e, is related to the nominal rate according to

$$e = at$$

Indeed, one serious source of inequity in administration of the property tax has been differences in assessment ratios applied to different classes of property both between jurisdictions and within jurisdictions.

Although the property tax is a tax on the value of an asset (real property), this can be translated into a tax on asset income, R. Denote the discount rate by r. Then

$$V = \frac{R}{r}$$

From this it follows that

$$tV = \frac{t}{r}R = t'R$$

Thus, if r = .1 and t = .05, then the tax rate on annual income ($\frac{t}{r} = t'$) is .5.

Finally, if revenues just cover costs and land and capital are the only inputs in production, it makes no difference, in terms of economic effects, whether the property tax is modelled as an excise tax

or as an equal rate tax on land and capital.[2] To elaborate, if

$$P = a_K P_K + a_T P_T$$

where P is price per unit of output, a_K and a_T are capital and land requirements per unit of output, and P_K and P_T are per unit rental rates on capital and land respectively, then a tax at rate t on inputs is equivalent to an equal rate tax on output.

Capitalization of Effective Rate Differentials

Property tax differentials (resulting from differentials in effective tax rates on otherwise identical properties) are said to be capitalized when the values of properties taxed below (above) the average rate rise (fall) by the amount of differential tax liability. As such, a capital gain (loss) is created for the current owner at the moment of capitalization which is realized upon the sale of the property.

The process of capitalization is easily explained. Under competitive market assumptions, property rentals will adjust such that

$$R = (r + t)V$$

where R is the annual market rental, r is the market rate of interest, t is the property tax rate and V is the market value of the property. The amount on the right hand side of the equation represents the

opportunity cost of the investment.[3] Similarly, for property taxed at some average rate, t^{AV}, we have

$$R^{AV} = (r + t^{AV})V^{AV}$$

Perfect mobility of consumers of housing services ensures that

$$R = R^{AV}$$

Substituting from above, this implies

$$(r + t)V = (r + t^{AV})\ V^{AV}$$

from which it follows that

$$\left(\frac{V - V^{AV}}{V^{AV}}\right) = \frac{(r + t^{AV})}{(r + t)} - 1$$

The expression on the left hand side represents the capitalized value of the tax differential as a fraction of the average market value. From this,

$$\text{if } t > t^{AV}, \text{ then } \left(\frac{V - V^{AV}}{V^{AV}}\right) < 0$$

which implies that such properties sell at a discount;

$$\text{if } t < t^{AV}, \text{ then } \left(\frac{V - V^{AV}}{V^{AV}}\right) > 0$$

which implies that such properties sell at a premium.

Economic Effects

The economic effects of the property tax, as with any tax, include the effects on the distribution of income (incidence) and the effects on the allocation of resources (efficiency). The incidence question is concerned with determining who bears the burden of the tax. The efficiency question is concerned with determining the extent of the waste associated with the potential misallocation of resources due to the presence of the tax. These two questions are not independent since the distribution of the excess burden will itself enter into the incidence calculations. Also, in addressing these questions it is important to give due consideration to the overall tax system of which property taxation is a part and to the economic environment in which the tax is imposed.

It should be noted that much of the existing literature on property taxation is based on closed economy models in which the property tax is examined in isolation from the rest of the tax system. It is important, therefore, to assess the relevance of this literature to the Canadian economy as an open economy in which a variety of tax instruments are simultaneously employed.

The "Old", "New" and "Benefits" Views

The "old" view of the property tax treats the tax as an excise tax. As such, the tax drives a wedge between consumer and producer prices, resulting in a deadweight loss. Attention has focused primarily on the residential property tax. The incidence question is answered by examining the elasticity of housing expenditure with respect to income; if this falls as income rises, the property tax is said to be regressive.

In contrast to this, the "new" view of the property tax treats the tax as a capital tax administered by independent local tax jurisdictions. It is assumed that the supply of capital to the economy as a whole is fixed and that capital is perfectly mobile between jurisdictions. Then, if all jurisdictions were to levy uniform effective tax rates, the burden of the tax would be entirely on owners of capital. In this case, the incidence question is answered by examining the income elasticity of demand for capital; if this rises as income rises, the property tax is said to be progressive.

If, however, differential rates are levied across jurisdictions, the potential for misallocating capital across jurisdictions and shifting some portion of the burden of the tax exists. According to the "new" view, capital flows out of relatively high tax communities into relatively low tax communities. The net return to capital falls in proportion to the average rate of tax across jurisdictions (the so called "profits" tax effect) while the amount of differential is forward shifted to consumers (the so called "excise" tax effect). These excise effects will cancel across jurisdictions if local residents are immobile or they

will be capitalized into land rents if local residents are mobile. In any event, the real burden of the tax falls on owners of capital.

The "old" and "new" views differ radically in their conclusions concerning the incidence of the property tax. It is therefore necessary to assess the validity of each of these views. Among academic economists, the "new" view is now widely accepted in that it is seen to emerge from the appropriate paradigm. In non-academic circles, however, the "old" view hangs on as part of the conventional wisdom, in part fuelled by the inevitable lag between the discussion of issues in professional journals and the revision of material in text books.

Yet another view of the property tax is the so called "benefits" view. This is the view that property taxes constitute a set of user charges for locally provided public goods and services. Under this view, local differentials in effective property tax rates are simply a reflection of local differentials in the level of public services provided and, as such, will not be capitalized into land rents. Rather, only differentials in "net fiscal benefits" (expenditures minus taxes) will be capitalized. In an economy with many jurisdictions, each offering a distinct tax-expenditure package and with fully informed and perfectly mobile economic agents, the property tax emerges as a pure benefits tax and results in no misallocation of resources.

Open Economy Considerations

Finally, the economic effects of the property tax may be quite different in an open economy framework with international capital mobility and commodity trade. Of particular interest is the possibility of exporting the burden of the property tax to foreigners either through reduced factor returns or through increased commodity prices.

Empirical Studies

Effective tax rate calculations, such as those reported for Canada in Gillespie (1980), hinge on the assumptions that are made about tax shifting. Whalley (1984), Bird and Slack (1978) and Thirsk (1982) have examined the effects on the resulting effective tax rate calculations of alternative shifting assumptions with regard to the property tax. The shifting patterns associated with the "old" and "new" views provide extreme cases. What they show is that not only will the assumptions made alter the view of the incidence of the property tax but the view of the overall incidence of the whole tax system may also be altered.

Horizontal Equity

Considerable attention has been focussed on the horizontal equity aspect of property taxation. Indeed, much of the recent debate has centred on the horizontal inequities inherent in a system in which

assessment practices are non-uniform. Differential treatment of business versus residential property, apartment buildings versus single family dwellings, properties with well established market values versus those which have to be estimated are only a few among the many reasons for horizontal inequity.

Resource Allocation Effects

The impact on the allocation of resources associated with property taxation is manifested in a variety of contexts: the intersectoral misallocation of resources due to the differential taxation of business property (farm and non-farm) versus residential property; the intrasectoral misallocation of resources due to the differential taxation of apartment buildings versus single family dwellings; the interjurisdictional misallocation of resources due to interjurisdictional rate differentials (these can arise unintentionally or as a result of deliberate competition between jurisdictions); and the international misallocation of resources due to international differentials in effective tax rates. Viewed as another form of capital taxation, property taxes also broaden the income tax base (in particular, the non-taxation of imputed net rental income and capital gains on owner-occupied housing in Canada has been described as making the existing system a hybrid of a broad based income tax system and an expenditure tax system) which in turn results in an intertemporal misallocation of resources due to the double taxation of savings.

Of particular importance is the notion that in the presence of other distorting capital taxes such as the corporation income tax, the property tax, itself viewed as another form of capital taxation, may be a second-best tax given the preferential treatment of owner occupied housing under current Canadian income tax laws. Indeed, in this context, some authors have argued that the property tax, far from causing a misallocation of resources, may in fact compensate for distortions elsewhere in the system and be welfare improving.

Motivation and Plan of the Paper

Before a meaningful discussion of property tax reform is undertaken, it would appear to be natural to first establish the strengths and weaknesses of the existing system. While much attention has been focussed on the incidence question (although with little appearance of resolution) very little has been done in attempting to quantify the efficiency costs associated with property taxation, and what work has been done, while indicative, is far from conclusive.

In the remainder of this paper, an attempt is made to assess these seemingly conflicting views of both the incidence and resource allocation effects of property taxation within a common framework. In section 3, the tax incidence question is addressed. First, the "old", "new" and "benefits" views of the property tax are developed and discussed in the context of a simple, multi-jurisdictional model. Then, the extension of the model to an open economy framework is discussed.

Next, some additional considerations that have been discussed in the literature are addressed. With this as background, various empirical studies of property tax incidence are examined. Finally, the focus turns to the issue of horizontal equity. In section 4, the efficiency issue is examined. Section 5 separates out the problems associated with the administration of the property tax and emphasizes that it is precisely because of poor administration in the past that much of the criticism which has been levelled at the property tax is justified. Section 6 discusses reform of the property tax within the existing tax system. Section 7 identifies the potential role of the property tax in a reformed tax system. Finally, section 8 provides a summary and a statement of the policy implications which arise from the paper.

3. THE INCIDENCE OF THE PROPERTY TAX

An Illustrative Model

In order to establish the relationship between each of the "old", "new" and "benefits" views of the property tax and to assess the validity of each of these, a simple analytical model is first developed.[4] The model assumes an economy in which there are N + 1 independent local tax jurisdictions. Each jurisdiction has available a fixed and immobile supply of land which is employed in the production of a composite commodity, H. H production also requires the use of capital which is perfectly mobile across jurisdictions but in fixed supply to the economy as a whole. Finally, it is assumed that land is always fully employed.

The supply of H in jurisdiction j is given by

$$H_j^S = h_j^S(K_j)$$

where K_j is the quantity of capital employed by jurisdiction j.

Housing demand in any jurisdiction is given by

$$H_j^D = h_j^D(P_j)R_j$$

where P_j is housing rental in jurisdiction j and R_j is its population.

Housing market equilibrium in each jurisdiction requires that demand equals supply:

$$h_j^D(P_j)R_j = h_j^S(K_j)$$

It is assumed that the technology of H production is linear homogeneous and perfect competition prevails. Then, in the presence of a uniform tax on land and capital at rate t_j, the unit cost function can be written as

$$P_j = c(P_K, P_{Tj})(1 + t_j)$$

where P_K is the net rental on capital (equalized across jurisdictions through migration) and P_{Tj} is the net rental on land in jurisdiction j.

From the definition of the elasticity of substitution, σ,

$$\hat{K}_j = \sigma(\hat{P}_{Tj} - \hat{P}_K)$$

where a "^" over a variable denotes a proportionate change.

As is shown in Technical Appendix A, this model can be solved for the proportionate change in land rents resulting from the imposition of a set of differential property taxes. The resulting expression is

$$\hat{P}_{Tj} = \frac{-(\eta - E)}{f_T(\eta - E) + f_K\sigma} dt_j - \frac{f_K\{(\eta - E) - \sigma\}}{f_T(\eta - E) + f_K\sigma} \hat{P}_K \qquad (1)$$

where η is the elasticity of demand for H, E is the elasticity of population supply with respect to P, f_T is the revenue share of land in H and f_K is the revenue share of capital in H.

Suppose population is perfectly immobile so that $E = 0$. Moreover, suppose that the tax change occurs in just one jurisdiction which is embedded in an economy of many jurisdictions. In that case it is reasonable to set $\hat{P}_K = 0$; that is, the net rental on capital is determined exogenously to the taxing jurisdiction. Under these conditions

$$\hat{P}_{Tj} = \frac{-\eta}{f_T\eta + f_K\sigma} dt_j$$

Since $f_T + f_K = 1$, this suggests that the effect of the tax change on land rents in the taxing jurisdiction hinges on the relative magnitudes of η and σ.

In order that the net rental on capital be unchanged in the presence of the tax, its gross rental must rise by the full amount of tax (see Figure 1) which necessitates an outflow of capital from the taxing jurisdiction. Initially, since land is in fixed supply, its net rental falls by the full amount of tax (see Figure 2) assessed on land. The outflow of capital has two effects. First, a reduction in the capital land ratio leads to a reduction in the gross rental on land relative to that on capital (see Figure 3). The magnitude of this effect depends on σ; the greater is σ, the less will be the implied reduction in land rental relative to capital rental. Second, an outflow of capital causes a reduction in the supply of H resulting in an excess demand for H and upward pressure on the price of H. Any increase in P is reflected in an increase in land rentals in proportion to land's share. The magnitude of this effect depends on η; the greater is η the less is the increase in P required to maintain equilibrium in the market for H.

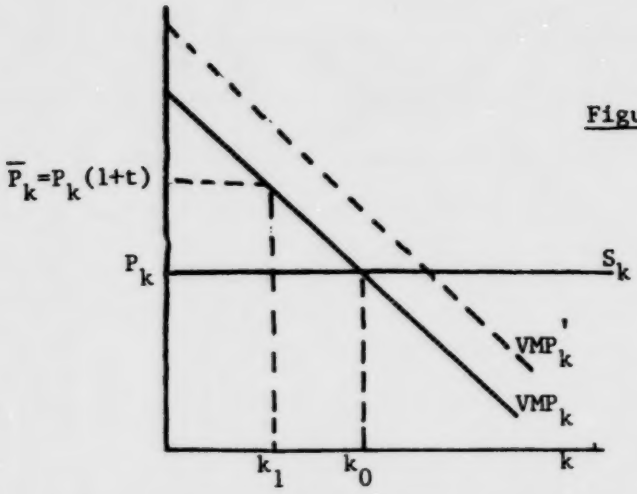

Figure 1

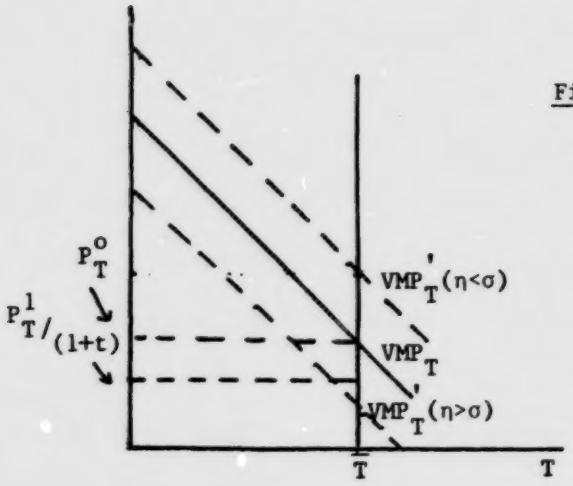

Figure 2

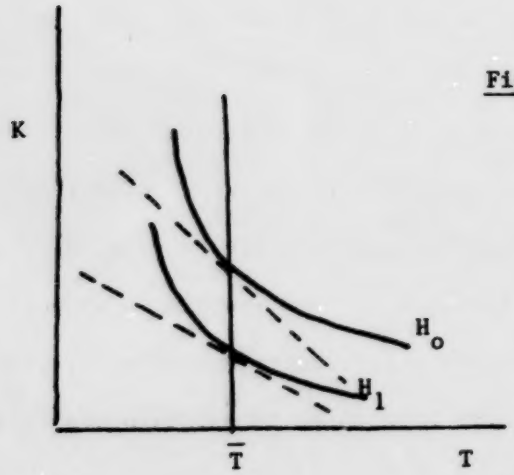

Figure 3

If $\eta > \sigma$, the burden on land exceeds the amount of tax assessed on land; part of the tax assessed on capital is shifted laterally to land and so is less than fully forward shifted. Only if $\eta = \sigma$ does land bear the tax exactly in proportion to its share in output. As special cases, if $\eta = \infty$, the tax is fully borne by land. The same is true if $\sigma = 0$.

It is possible to solve for $\hat{P}_K$ through an examination of the capital market equilibrium condition which requires that the net return to capital be equalized across jurisdictions. Denote the first jurisdiction, $j = 1$, as type A and the remaining N jurisdictions as type B. Since capital is paid its value of marginal product in each jurisdiction, equilibrium requires that

$$P_A MP_{KA} = P_B MP_{KB}$$

As shown in Technical Appendix A, using the full employment condition for capital and the assumption that jurisdictions are initially identical, this condition can be solved for the proportionate change in the net rental on capital resulting from the imposition of a set of differential taxes:

$$\hat{P}_K = \frac{-(N dt_B + dt_A)}{N + 1} \qquad (2)$$

Define

$$dt^{AV} = \frac{Ndt_B + dt_A}{N + 1}$$

This is Mieszkowski's (1972) average rate of tax. Equation (2) states that the net return to capital falls in proportion to the average rate of tax across jurisdictions when a set of differential property taxes is imposed.

Suppose property taxes are imposed at a uniform rate across jurisdictions ($dt_A = dt_B$). As expected, the property tax will be borne by land and capital directly in proportion to their shares in output. In this case, the property tax is nothing more than a uniform rate tax on two factors in fixed supply.

Where property taxes are imposed at differential rates across jurisdictions, it is not quite as straightforward to determine the distribution of the burden. As it turns out, the outcome in this case is exactly the same as for uniform rates. For example, consider the extreme case where $dt_A > 0$, $dt_B = 0$. Then,

$$\hat{P}_K = \frac{-dt_A}{N + 1}$$

For large values of N, $\hat{P}_K$ becomes negligible and the discussion above where $\hat{P}_K = 0$ applies. That discussion, however, was partial equilibrium in nature; it failed to take into account the impact on the price of H and factor returns in type B jurisdictions brought about by the outflow of capital from the taxing jurisdiction subsequent to the tax increase. Summing across jurisdictions results in

$$\sum_{j=1}^{N+1} \hat{P}_K K_j = (N + 1)\, K_A \hat{P}_K$$

$$= -(N + 1)K_A \frac{dt_A}{N+1} = -K_A dt_A$$

This states that the net return to capital as a whole falls by the amount of tax assessed on capital in the taxing jurisdiction. Also

$$\sum_{j=1}^{N+1} \hat{P}_{Tj} = -dt_A$$

which states that the net return to land as a whole falls by the amount of tax assessed on land in the taxing jurisdiction. Similarly, positive excise effects in the taxing jurisdiction will be offset by negative excise effects summed across non-taxing jurisdictions.

This conclusion, that the burden of the property tax is on owners of taxed factors in direct proportion to their shares in output, has recently been reaffirmed in Mieszkowski and Zodrow (1984, 1985) in response to criticisms of the "new" view of property tax incidence as originally formulated in Mieszkowski (1972). Notice that although inter-jurisdictional movements of capital will impact on net land rents in each jurisdiction, depending on the relative magnitudes of η and σ as described above, such effects are relative, not absolute, and cancel across jurisdictions. Similarly, excise effects associated with local tax differentials cancel across jurisdictions. The real burden is on owners of land and capital in the economy as a whole.

This is a strong conclusion indeed, in that it has been shown to hold even in a situation where a tax change occurs in a single jurisdiction that is small relative to the economy as a whole. It is precisely in such a situation that it is sometimes argued the "old" view of property tax incidence may be valid. What has been shown here is that the "old " view of property tax incidence is based on partial equilibrium analysis and misrepresents the allocation of the real burden of the property tax. Moreover, even as a partial equilibrium analysis, the "old" view is incomplete in that it does not identify the importance of the relative magnitudes of η and σ in generating a given result. The text book statement of the "old" view is that land bears the amount of tax assessed on land while the amount of tax assessed on capital is fully forward shifted to renters. As has been shown above, however, this result only goes through if $\eta = \sigma$. In any event, this may be of little consequence since the result holds only in partial equilibrium.

The model can also be used to demonstrate Hamilton's (1975) claim that if residents are perfectly mobile, then in the absence of local expenditure differentials, local property tax differentials will be fully capitalized into land rents. For $E = \infty$, equation (1) becomes

$$\hat{P}_{Tj} = -dt^{AV} + \frac{(dt^{AV} - dt_j)}{f_T} \qquad (1')$$

The second expression on the right hand side of (1') indicates that the full amount of local tax differential is capitalized into land rents. Again, such capitalization is relative rather than absolute. Summed across jurisdictions, the real burden of a set of differential local property taxes falls on owners of land and capital in the economy as a whole.

Of course, local property tax differentials may reflect nothing other than local expenditure differentials and it is precisely the recognition of this which underlies the "benefits" view of the property tax. This view was originally put forward by Hamilton (1975) in the context of the residential property tax and has been extended to incorporate industrial/commercial property taxes in Fischel (1975) and White (1975). The basic model is one which represents a Tiebout equilibrium. In an economy consisting of a large number of local fiscal jurisdictions, each offering a distinct tax-expenditure package and each precisely zoned (in the sense that individuals are just able to attain their desired level of housing consumption), like individuals will congregate and property taxes will constitute a set of non-distorting user charges for local public services. Variations in property tax rates

across jurisdictions will have no effect on property values. While the basic Tiebout equilibrium involves homogeneous communities (like individuals will congregate), Hamilton (1975) has extended the "benefits" view to cases in which heterogeneous communities exist and shows that the argument still goes through so long as precise zoning is applied to each group within any jurisdiction.

However, as Mieszkowski and Zodrow (1975) point out, the assumption of precise zoning is crucial to the "benefits" view. In terms of the model presented above, if the zoning constraint is not binding, then the "benefits" view only goes through if it is assumed that the elasticity of demand for H is zero. If this were not the case, there would be an incentive for individuals to reduce their consumption of the taxed commodity and thereby reduce their tax burden. In this sense, the property tax is once again seen to be a distortionary tax which impacts on the net return to land and capital in the economy as a whole. Thus, in the absence of precise zoning, the property tax can no longer be viewed as a pure benefits tax.

In defense of the "new" view of property tax incidence and to demonstrate that there is, in fact, no conflict between it and the "benefits" view, Mieszkowski and Zodrow (1984, 1985) reformulate the "new" view in a model which simultaneously takes into account local expenditures as well as taxes. In its simplest form, their model has the same structure as that outlined above with a fixed population in each jurisdiction. Within that general framework, they highlight the optimization problem faced by each local government in determining the level of local public services and output for its jurisdiction as well

as the property tax rate.

Assume that local public services (G) are publicly provided private goods. Provision of G is financed through a mixed system of a non-distortionary head tax, h, and a property tax levied on capital and land at rate t such that

$$PG = tP_K K + tP_T T + h$$

Since the supply of land is assumed to be fixed, a property tax levied on land alone would be non-distortionary and equivalent to a head tax. However, if the local government's ability to levy head taxes is constrained and a distortionary tax on capital is implemented, then, as before

$$\hat{P}_K = \frac{-dt_A}{N + 1}$$

and

$$\overline{K}\hat{P}_K = -(N + 1)K_A \frac{dt_A}{N+1} = -K_A dt_A$$

Mieszkowski and Zodrow (1985) argue that where local governments are forced to levy capital taxes these will be distortionary unless precise zoning holds or $\eta = 0$. This presupposes that local governments first exhaust the potential for taxing away land rents, in effect a form of head taxation. The Mieszkowski and Zodrow (1985) model is formally developed in Technical Appendix B.

The Open Economy Extension

Bird (1974) has argued that in an open economy such as Canada the assumption of a fixed supply of capital to the economy as a whole is inappropriate in modelling property tax shifting. Instead he argues that capital should be modelled as being in perfectly elastic supply to the economy as a whole at some exogenously given net rental rate. Given this, an increase in the property tax rate in Canada relative to that in the United States must result in an outmigration of capital such that the gross rental rate on capital in Canada rises by the full amount of tax. In that event, the burden of the tax will be shifted to immobile factors such as land and labour, reducing their real returns. Moreover, he argues that this arises not because of the property tax per se but because of differential property tax rates in Canada and the United States; if U.S. rates were simultaneously increased, then owners of capital would be unable to escape the burden of the tax.

Bird's (1974) line of argument is overly simplistic. First, property taxes impact on both tradeable and non-tradeable goods. Housing, for example, is non-tradeable. As a small open economy, it is not uncommon to model Canada as facing fixed terms of trade. However, some authors choose to model Canada as a price taker on import markets but a price maker on export markets (or, at least, on a subset of export markets). In that case, property taxes may result in terms of trade effects which introduce a potential for exporting at least some of the tax burden to foreign consumers. Among other things, the extent to which the tax burden can be exported will depend on the elasticity of

foreign demand for Canadian exports. In the case of non-tradeable goods, property taxes may be forward shifted to domestic consumers rather than to immobile factors such as land and labour.

Second, as was outlined previously, even though, as a small open economy, Canada may take the net rental rate on capital as given, this does not imply that the net return to capital as a whole will not fall if a tax is imposed on capital in Canada. As argued above, the resulting outmigration of capital from Canada will depress the net return to capital elsewhere by an amount equal to the tax assessed on capital in Canada. Again, some portion of the tax burden may potentially be shifted to foreigners. One way of capturing this is to model Canada as facing a less than perfectly elastic supply curve for foreign capital.

An alternative view of international capital mobility is provided in Ballentine and Thirsk (1979). They argue that in the presence of other forms of capital taxation, such as the corporate income tax, and given existing international tax treaties, foreign capital flows should be modelled as responding to the gross rental on capital in Canada (net of property taxes which are deductible as a business expense). In that case, any policy change in Canada which results in upward pressure on the gross rental rate on capital will result in an inflow of foreign capital even though the net rental on capital may fall.

The assumptions which underlie the Ballentine and Thirsk (1979) proposition are outlined in Technical Appendix C. Briefly stated, if the corporate tax rate in Canada is below that in the U.S., if a U.S. tax credit is given against any corporate taxes paid in Canada on U.S. owned capital employed in Canada, and if all foreign earnings are

instantaneously repatriated, then the effective rate of corporate tax on U.S. capital employed in Canada will be the U.S. rate. Canadian owned capital is assumed to be restricted to domestic markets. U.S. capital will be allocated between Canadian and U.S. markets such that its net return is the same regardless of whether it is employed domestically or abroad. Given the above assumptions and that property taxes are deductible against corporate income, this implies that

$$\bar{P}_K(1 - t_K) = \bar{P}_K^*(1 - t_K^*)$$

where $\bar{P}_K$ is the gross rental on capital, t_K is the property tax rate and a "*" superscript denotes U.S. values for these variables.

As a small open economy, it might be assumed that Canada takes $\bar{P}_K^* (1 - t_K^*)$ as given. If this were the case, then the above condition would imply that any increase in the property tax rate in Canada must be offset by an increase in the gross rental rate on capital in Canada. This would require an outflow of U.S. owned capital from Canada. However, as long as $t_K < t_K^*$, the above condition implies $\bar{P}_K < \bar{P}_K^*$; the gross rental rate in Canada must be below that in the U.S. Also, given the assumption that the corporate tax rate in Canada is below that in the U.S., it must be the case that the net return to Canadian owned capital exceeds that to U.S. owned capital. In the special case where the Canadian and U.S. corporate tax rates are the same, however, the net returns will also be the same which corresponds exactly to the formulation in Bird (1974).

In terms of the model of tax incidence which was previously

outlined, Canada can be thought of as a type A jurisdiction and the U.S. as consisting of type B jurisdictions. An increase in the U.S. property tax rate will result in a decrease in P_K^*, $\bar{P}_K^*$ unchanged. Since $\bar{P}_K^*(1 - t_K^*)$ therefore falls, an inflow of U.S. capital to Canada is induced, reducing $\bar{P}_K$ and P_K. Thus, property tax increases in the U.S. are borne by owners of capital in both the U.S. and Canada.

An increase in the Canadian property tax rate results in an outflow of U.S. owned capital from Canada such that $\bar{P}_K$ rises by just enough to compensate for the tax increase, $\bar{P}_K(1 - t_K)$ unchanged. However, by the arguments outlined above

$$\hat{P}_K = \frac{-dt_A}{N+1}$$

and summed over all jurisdictions (Canada and the U.S.) the net return to capital as a whole (in both Canada and the U.S.) falls by the amount of increased tax revenue generated in Canada. The real burden of the tax increase is on owners of land in Canada and on owners of capital as a whole. Since the value of capital imported to Canada falls, balance of payments equilibrium requires an offsetting reduction in the value of net exports. In any event, it does not follow <u>a priori</u> that any portion of the tax on capital in Canada is shifted to immobile factors; this will depend on the relevant elasticities.

In summary, although the circumstances under which a property tax increase is introduced may alter the way in which the tax increase is modelled, the overall conclusions are unaltered. The burden of the property tax is on owners of land in the taxing jurisdiction(s) and owners

of capital as a whole. This is a strong result; one that clearly establishes the property tax as a form of capital taxation rather than an excise tax. As such, the conclusions concerning the incidence of the property tax are quite dramatically altered, as is discussed below.

Further Considerations

Before turning to specific incidence calculations, it is worth devoting some attention to further considerations concerning the shifting of the property tax, most of which were excluded by the restrictive framework outlined above. One issue has to do with the important distinction between the residential property tax and the industrial/commercial property tax. Another has to do with the insights which can be gained from examining property taxes within the class of urban land use models. Also, some attention should be paid to intra-jurisdictional tax differentials; in particular, the differential taxation of industrial/commercial property and of residential property. Finally, the excess burden associated with differential property taxes cannot be ignored in assigning incidence when discrete changes are considered rather than infinitesimally small changes.

Much of the analysis of property tax shifting has focussed on tax changes in a single jurisdiction that is part of a large economy. Common to all such analyses is the assumption that the net rental on capital is exogenously given. Varying assumptions are made about labour mobility. Also, varying assumptions are made about the market for land.

Finally, some analyses are based on models in which only housing is produced. Housing is non-tradeable and its rental is endogenous. Others are based on models in which a composite commodity is produced. This commodity is tradeable and its price is exogenously given. Yet others are based on two sector models with housing and non-housing production. Typically, housing production involves land and capital while non-housing production involves labour, land and capital. Thus, the wage rate is endogenous as is the rental on land, and both land and capital must be allocated across the two sectors such that their respective net returns are equalized regardless of where they are employed. Different assumptions yield different shifting patterns, but, for the most part, the incidence results from all such analyses are partial equilibrium in that they ignore the general equilibrium consequences of interjurisdictional factor movements. Also, the shifting patterns which emerge from such analyses can only be interpreted as applying to tax changes which occur in a jurisdiction which is small relative to the economy as a whole; as such, the results are of limited relevance to large scale incidence studies.

In models of the housing market alone, it is typically argued that landowners bear the residential property tax in proportion to land's share in housing. The amount of tax on capital is forward shifted to consumers of housing services. Thus, owner-occupiers bear the burden of residential property taxes assessed on owner-occupied housing. Renters bear the burden of residential property taxes assessed on rental property in proportion to capital's share in housing, the balance is borne by landowners. While it has already been shown that results such

as these are subject to further qualification, they are widely quoted and fundamental to many applied incidence calculations.

In models that focus on non-housing production, it is typically argued that landowners also bear the industrial/commercial property tax in proportion to land's share in output. The amount of tax on capital is either forward shifted to consumers (both locally and those in other jurisdictions with which trade occurs,raising the possibility of tax exporting) or shifted laterally to land and labour. The extent of such shifting to labour will be limited by the degree of labour mobility and production technology. A widely used assumption in applied incidence calculations has been that industrial/commercial property taxes are largely forward shifted to consumers.

Some authors have examined residential property taxes in one sector urban land use models. These include Richman (1967), LeRoy (1976) and Arnott and MacKinnon (1977). What is fundamentally different in these models is that land has an alternative, non-residential use in which property taxes can be avoided and land rents accrue to locational advantage vis-a-vis some central marketplace. These features combine to mitigate the extent to which local property tax increases impact on the net return to land locally.

Sonstelie (1979), Haurin (1984), Ballentine and Thirsk (1982) and Hobson (1982) have examined property taxes in the context of two good (housing and non-housing), three factor (land, labour and capital) models of a single tax jurisdiction that is part of a larger economy. In a less conventional model, Brueckner (1981) can also be included in this category. All are concerned with the extent to which property taxes

are shifted to immobile factors, especially labour and the extent to which intersectoral reallocations of factors may influence the shifting results.

Haurin (1980), Hobson (1985), Polinsky and Rubinfeld (1978) and Sullivan (1984) and (1985) have examined property taxes in two sector urban land use models with endogenous labour income. An important feature of these models has to do with the treatment of labour mobility. So called "closed city" models treat the supply of labour as fixed and solve for the local utility level. In such models, property taxes can impose a real burden on local residents. On the other hand, so called "open city" models take the local utility level as exogenously given and treat the supply of labour as being endogenous. Clearly, property taxes can impose no real burden on local residents given the assumption of a fixed utility level. It is possible, however, to identify relative price effects and the implied impact on resource allocation. In "open city" models, the real burden of a local tax change necessarily falls on landowners; to the extent that landowners live outside the city, the tax burden is exported.

Brueckner (1981) Courant (1977), Hobson (1982) and Wilson (1984) have all examined multi-jurisdictional models incorporating local tax differentials. Questions addressed include the efficacy of using the "average" rate of tax across jurisdictions as a measure of the burden on capital and the extent to which "excise" effects are reflected in output prices and/or factor returns (especially immobile factor returns).

Courant (1977) argues that the excess burden associated with differential property taxes cannot be ignored in assigning incidence. In

particular, he argues that if a set of differential property taxes were to be replaced by a revenue preserving uniform rate across jurisdictions, the impact on the net return to capital would be ambiguous. This occurs because the excess burden associated with differential rates is eliminated under uniform rates and the benefits of the implied efficiency gain must be allocated across factors. Accordingly, owners of capital may gain and the average rate of tax across jurisdictions therefore understates the burden on capital of a set of differential property taxes.

Empirical Studies

The importance of the shifting assumptions made about the property tax to computations of effective tax rates, for example those reported for Canada in Gillespie (1980), is widely recognized. This issue is dealt with in Musgrave and Musgrave (1973), Bird and Slack (1978), Thirsk (1982), St.-Hilaire and Whalley (1982), Whalley (1984) and Boadway and Kitchen (1985).

Table I is adapted from Table 12-2 in Musgrave and Musgrave (1973) and shows effective tax rate calculations for property taxes in the U.S. based on alternative shifting assumptions. Case 1 reflects the shifting assumptions associated with the "old" view of property tax incidence. Under these assumptions the property tax is seen to be regressive at all but the very top end of the income distribution. Case 2 reflects the "new" view of property tax incidence. Here the tax is seen to be mildly regressive at the bottom end of the distribution and progressive

TABLE 1

Significance of Alternative Incidence Assumptions

(Tax as Percentage of Total Family Income)

Case	Property Tax	Selected Income Brackets			
		$4,000 - $5,000	$12,500 - $17,500	$35,000 - $92,000	$92,000 - and over
1	R on owner; R on tenant B - one-half capital income, one-half consumption	5.7	3.7	2.9	3.3
2	All on capital income	4.4	2.7	7.2	9.9
3	OR on owner, R and B on capital income	4.4	3.3	5.4	7.1
4	OR on owner, R on tenant B on capital income	5.3	3.3	4.5	5.8
5	OR on owner, R on tenant B on consumption	6.1	4.1	1.2	0.8

OR stands for owner-occupied residences: R stands for rental property; B stands for other business property

Source: Musgrave and Musgrave (1973)

thereafter. Cases 3 - 5 reflect various combinations of these two views.

Table 2 is adapted from Table 2 in Thirsk (1982) and summarizes some effective tax rate calculations reported in Bird and Slack (1978) and in Ballentine and Thirsk (1979). These figures pertain to the Canadian residential property tax. Cases 1 and 5 are reproduced from Bird and Slack (1978) and represent shifting assumptions ranging from those associated with the "old" view (Case 1) to those associated with the "new" view (Case 5). Case 1 shows the residential property tax to be regressive. Case 5 indicates a U-shaped profile with the property tax becoming quite progressive at the top end. Even under "new" view shifting assumptions the residential property tax remains regressive at the lower end reflecting the concentration of home ownership among retirees.

Cases 6 and 7 are reproduced from Ballentine and Thirsk (1979) and result from a general equilibrium model of the Canadian economy with a fairly sophisticated representation of international capital flows as discussed previously. In their analysis, the property tax increase is used to finance a proportional increase in local government services. Case 6 is based on the assumption of a relatively low foreign capital supply elasticity. Again the U-shaped profile emerges although the tax does not appear to be as progressive at the top end as in Case 5 nor as regressive in the middle range. Case 7 is based on a higher value for the foreign capital supply elasticity. Although a U-shaped incidence profile emerges once again, it is not as pronounced as in the other cases. What is particularly interesting is that the Ballentine and Thirsk (1979)

TABLE 2

Alternative Estimates of the Incidence of the Residential Property Tax

(Taxes as a Percentage of Income)

	CASE	Under $3,000	$3,000-$3,999	$4,000-$4,999	$5,000-$5,999	$6,000-$6,999	$7,000-$9,999	$10,000-$14,999	over $15,000	all classes
1	OR on owner; R - protion on land on landowner, portion on capital on tenant	6.9	5.3	3.8	3.1	3.3	3.1	2.4	2.1	2.8
2	OR on owner; R - portion on land on landowner, portion on capital on owner and tenant evenly	6.7	5.3	4.2	3.0	3.1	2.9	2.3	2.3	2.8
3	OR on owner; R on owner	6.6	5.4	4.6	2.8	2.0	2.8	2.1	2.6	2.8
4.	OR and R - portion on land on owner, portion on capital on owners of capital as a whole	6.1	5.2	4.8	3.3	3.6	2.1	1.7	3.7	2.8
5	OR and R - all taxes borne by owners of capital as a whole	5.9	5.1	4.9	3.5	3.8	1.8	1.5	4.0	2.8
6	OR and R - as above, low foreign supply elasticity	7.1	4.7	3.4	2.4	2.4	2.1	2.4	3.4	2.8
7	OR and R - as above high foreign supply elasticity	6.3	5.5	3.9	2.8	2.6	2.3	2.4	3.2	2.8

OR stands for Owner-occupied residences; R stands for rental property

SOURCE: Thirsk (1982)

results confirm that an increase in Canadian property taxes may be borne by owners of capital in Canada even in an open economy framework.

The results of studies such as Gillespie (1980), Bird and Slack (1978) and Musgrave and Musgrave (1973) are all dependent not only on the shifting assumptions that are made concerning the property tax but also on the concept of income employed. These two distinct elements are emphasized in St.-Hilaire and Whalley (1982) and Whalley (1984). In particular, the income concept used in computing effective tax rates should be one that is independent of the shifting assumptions that are employed; rather than income gross of taxes, income net of factor taxes but with no reallocation of sales and excise taxes may be more appropriate. Moreover, the income concept used should take into account the institutional detail of the tax system. Pechman and Okner (1974), for example, fail to take into account the fact that in the U.S. property taxes on owner-occupied housing are deductible although the imputed net rental income on owner-occupied housing is exempted for income tax purposes. Whalley (1984) and St.-Hilaire and Whalley (1982), however, do take into account the favourable treatment of owner-occupied housing under Canadian income tax laws. Also, property tax credits should be accounted for. Chinloy (1978) and Bird and Slack (1978) demonstrate how this can easily convert what appears to be a regressive tax into one that is, at worst, proportional. Finally, Aaron (1975) argues that some concept of average income (averaged over the relevant number of years) should be used in computing effective tax rates rather than annual income data.

Aaron (1975) also argues that effective tax rate computations should take into account not only the ratio of rental expenditures to

income for different income classes, but also the ratio of property values to rents of housing occupied by tenants at different income levels and the ratio of taxes to market value. In particular, there is some evidence that value to rent ratios may increase with rent; thus, if rental expenditures rise as income rises, property taxes will tend to be progressive assuming market value assessment. Non-uniform assessment practices, however, will offset this tendency.

Based on published and unpublished work by St.-Hilaire and Whalley, Table 4 shows effective property tax rates by income class under each of three alternative sets of shifting assumptions. In Case 1, it is assumed that the burden of the property tax falls entirely on owners of capital (including land) in the economy. In Case 2 it is assumed that the burden of the property tax on structures and improvements is forward shifted to consumers while the burden on land is borne by landowners (capital). Finally, in Case 3, it is assumed that the burden is shifted entirely to immobile labour and transfers in the economy.

Case 1 is consistent with the "new" view of property tax incidence. Noticeably, the tax becomes markedly progressive at the top end. Case 2 is consistent with the "old" view and indicates that the tax is regressive at the bottom end and proportional thereafter. Finally, Case 3, although the potentially most regressive case, indicates that the property tax is proportional.

This last case is what St.-Hilaire and Whalley (1982) refer to as their small open economy case. Yet this representation ignores the facts that (a) part of the burden of the tax on housing may be forward shifted to consumers of housing services (housing is a non-tradeable good)

TABLE 3

Effective Property Tax Rate Calculations
Based on Alternative Shirting Assumptions

Income Classes	(1)	(2)	(3)
Under $6,500	3.3	6.4	4.9
6,500 - 7,500	4.2	7.6	4.6
7,500 - 8,500	3.6	6.9	4.8
8,500 - 10,000	2.8	5.7	5.0
10,000 - 11,500	3.2	5.0	4.9
11,500 - 13,000	2.7	4.6	5.0
13,000 - 14,500	2.6	4.3	5.0
14,500 - 16,000	2.5	4.1	5.1
16,000 - 18,500	3.7	4.1	4.8
18,500 - 21,000	3.5	4.1	4.8
21,000 - 25,000	3.5	3.8	4.8
25,000 and over	8.4	4.0	3.6

(1) Capital bears the burden of property tax. (Land rents included in capital income.)

(2) Forward shifting of property taxes on structures and improvements. Land bears burden in proportion to its share in output (reflected in a fall in domestic capital income.)

(3) Burden shifted to labour and transfers.

Source: The author wishes to thank France St.-Hilaire for providing the figures shown in cases (2) and (3). These figures underlie the calculations in St.-Hilaire and Whalley (1982) and Whalley (1984).

and (b) the amount of tax assessed on land will be borne by landowners (which, in their formulation, will be reflected in a reduction in domestic capital income). Given this, their Case 2 may, in fact, be more representative of the small open economy case than their suggested case.

In all of the above studies, given the assumption that the property tax on rental property is forward shifted to tenants, the tax burden as a fraction of income can be written as

$$\frac{T}{Y} = \left(\frac{T}{V}\right)\left(\frac{V}{R}\right)\left(\frac{R}{Y}\right)$$

where T is the tax paid on a property with market rental (either explicit or implicit) R and value V and Y is income. (T/V) is the effective tax rate.

As Aaron (1975) points out, tax incidence will depend not only on the ratio of rental expenditures to income for different income classes (which is the primary determinant of incidence in the above studies) but also on the value to rent ratio (V/R) and the effective tax rate (T/V) for different income classes. There is some evidence that value to rent ratios may increase with rent paid while effective tax rates may fall as value rises.[5] If so, the claim that the property tax is regressive is supported.

However, if effective tax rates remain constant across income classes, increasing value to rent ratios would suggest a lesser degree of regressivity than is commonly believed. Indeed, if the ratio of rental expenditures to income were constant across income classes, an increasing value to rent ratio coupled with uniform effective tax rates across income classes would suggest progressivity rather than proportionality.

It should also be noted that property tax incidence measured against current income (as in the above studies) rather than permanent income can only bias the results towards an appearance of regressivity. Housing expenditures are tied to permanent income rather than current income and, although mixed, the evidence would suggest proportionality between such expenditures and permanent income. Given this, the case for the alleged regressivity of the property tax is further weakened.[6]

With regard to owner-occupiers, it might be argued that income is not the appropriate basis against which to measure incidence given that the tax is assessed on property value, not income.[7] Rather, what is relevant is uniformity of effective tax rates within (or, for that matter, across) classes of property. Indeed, uniform effective tax rates will result in regressivity if the ratio of property value to income falls as income rises, but this should not be taken as a criticism of the property tax per se; the tax is nonetheless fair in that all properties within a given class or across classes (depending on how the base is defined) are treated equally. If this were not the desired outcome, non-uniform assessment to value ratios or a variable rate structure would be called for. To put it all another way, if the ultimate criteria for choosing a revenue source is progressivity, the existing income tax base coupled with a progressive rate structure would certainly be more appropriate than the property tax.

A potentially crucial problem, common to all the above studies, is that they ignore variations in property taxes across jurisdictions. To the extent that these variations are correlated with income, the calculations could be quite misleading. Also, as mentioned above, the excess burden associated with local differentials should not be ignored.

Care must also be taken to account for tax exporting to the extent that this occurs. Indeed, with regard to the residential property tax, it would be useful to compute separate effective tax rates for renters and owner-occupiers. In particular, part of the burden on renters may be exported to foreigners whereas this cannot be the case for owner-occupiers.

Boadway and Kitchen (1984) summarize this literature in the following statement: "...the new view indicates that the property tax is not as regressive as the traditional view claims nor is it likely to be as progressive as some of the advocates of the new view have suggested. Empirically and theoretically, the incidence question is in an embryonic state. Further research and analysis are required before any definitive and conclusive position can be taken."

An alternative approach to empirical incidence analysis is full fledged numerical general equilibrium analysis. Indeed, Devarajan, Fullerton and Musgrave (1980) contrast three alternative approaches to incidence analysis; namely, the computation of effective tax rates using (a) ad hoc shifting assumptions, (b) analytical general equilibrium analysis and (c) numerical general equilibrium simulation.

One major advantage of large scale general equilibrium simulation models is that they permit the inclusion of a multiplicity of taxes and scope for modelling government expenditures. For example, Ballentine and Thirsk (1979) conduct an experiment in which a proportional expansion in government services is financed through an increase in the property tax. The net fiscal incidence assumes a U-shaped profile. In another experiment, it is found that substituting a higher

corporate tax for a reduced non-residential property tax is proportional in its incidence. On the other hand, substituting a higher personal income tax for a reduced residential property tax is progressive in its incidence. Moreover, approximately 35% of the burden measured as a percent of revenues is exported to foreigners when the non-residential property tax is lowered in favour of an increase in the corporate tax rate.

Strikingly, Ballentine and Thirsk's (1979) results indicate that some portion of the burden of the residential property tax assessed on capital in the housing sector is borne by landowners. This reinforces the significance of recognizing the immobility of land in contrast to the mobility of capital in analyzing property taxation.

Implicit in the incidence calculations in Ballentine and Thirsk (1979) are the efficiency effects associated with alternative tax regimes. The impact on domestic welfare associated with each tax policy considered will depend on both the extent to which the tax burden can be exported to foreigners and on the relative efficiency of the induced reallocation of resources.

Devarajan, Fullerton and Musgrave (1980) examine the effects of changes in the property tax in a closed economy framework. However, their discussion focusses not only on incidence but also on efficiency. In their model, revenues are redistributed to residents in proportion to disposable income. Their results indicate that an increase in the property tax will be largely regressive except at the top end of the income distribution where it is markedly progressive. This is in marked contrast to the incidence results based on ad hoc shifting assumptions

and which fail to account for expenditure of tax revenues. On second-best grounds, they find that an increase in the property tax is welfare improving. As a result, the tax change involves not only a redistribution of income in the economy but also an increase in real national income. Substituting a higher property tax for a reduced personal income tax also tends to be largely regressive in its incidence and, in this case, only mildly progressive at the top end of the income distribution.

Fullerton and Henderson (1984) find that if the property tax is viewed as being a pure benefits tax rather than a capital tax, the effective rate of tax on capital in the U.S. falls from .26 to .09 based on 1980 data. This result is quite dramatic and emphasizes the importance of the property tax in any review of capital taxation as a whole.

Daly, Jung, Mercier and Schweitzer (1985, 1986) find that the property tax is an important contributor to observed variations in tax rates on capital (corporate plus property plus personal) within both the manufacturing and non-manufacturing sectors of the Canadian economy. Excluding property taxes from their calculations of marginal effective tax rates results in a reduction of 5 to 7 percentage points in the overall tax rate and significantly reduces the degree of variation in rates.

Property tax incidence has also been examined in the context of urban general equilibrium simulation models. Arnott and MacKinnon (1978), Haurin (1980), Hobson (1985) and Sullivan (1985) all examine the effects of a change in the residential property tax in a single community. In their models, the supply of capital to the community is taken as being perfectly elastic at a fixed rental. The analysis in Arnott and

MacKinnon (1978) and Hobson (1985) can also be interpreted as pertaining to the impact on a representative community of a change in the national average rate of tax in a small open economy in which the net rental on capital is exogenously given and it is that interpretation which is emphasized here.

These two papers assume a fixed population whereas Haurin (1980) and Sullivan (1985) assume variable population. The results of these latter papers therefore pertain only to local differentials. Hobson (1985) considers both fixed and variable population formulations of the model. Sullivan (1984) has examined the business property tax in a similar framework.

Arnott and MacKinnon (1978) find that the burden on land is less than in proportion to land's share in housing. This result arises because land has an alternative, non-residential use. Hobson (1985) finds that the burden on land is about the same for both business and residential property taxes; both cases result in land bearing less burden than under an equal revenue lump-sum tax on net differential land rents.

Again, computations such as these include the distribution of the excess burden of the tax. Hobson's (1985) analysis also permits wage adjustments. An increase in the non-residential property tax rate results in a reduction in the wage rate (part of the burden is shifted to labour), however this is partially offset by a reduction in housing rentals. This emphasizes a major advantage of general equilibrium analysis; that the effects of taxes on both the "sources" and the "uses" side are taken into account. On the other hand, an increase in the residential property

tax rate has a negligible impact on wages. Similar results are contained in Ballentine and Thirsk (1982).

Horizontal Equity

Much of the criticism of the property tax has focussed on its alleged regressivity. However, the property tax has also been subject to charges of horizontal inequity arising both from the choice of tax base and from the methods used to assess the value of the base.[8] The property tax base is, in practice, limited to real property. Given this, any two individuals who are identical in terms of income, wealth and expenditure but who hold different proportions of their assets in the form of real property will pay different amounts of property tax. If the property tax is viewed as being a benefits tax, this situation is perfectly defensible. Otherwise, a fundamental principle of taxation is violated.

Another source of horizontal inequity lies in uneven assessments both within and between jurisdictions. Two individuals who are identical in all respects including property holdings may pay different amounts of property tax purely due to uneven assessment practices.

Of course, two individuals with different incomes but identical property holdings and assessments will pay the same amount of property tax. This will be horizontally equitable if the basis of equality is property holdings even though it is vertically inequitable if the basis of equality is income. Once again, if the property tax is viewed as being a benefits tax, this situation is perfectly defensible.

Carleton (1981) has demonstrated that the extent to which the property tax can be forward shifted to renters will, in general, depend on a property's location within an urban area. Bossons (1981) has argued that two otherwise identical individuals who own identical properties situated at different locations in a city vis-a-vis some central point will pay different amounts of property tax if property values decline with distance from the centre. In both cases, the principle of horizontal equity is violated.

The most commonly cited cause of horizontal inequity results from inconsistencies in assessment of property value. Such inconsistencies can arise either intentionally or unintentionally and can appear both within a given jurisdiction and between jurisdictions. Intentional inconsistencies may arise as the result of an attempt to encourage a particular type of land use at a particular location in a city. Unintentional inconsistencies typically arise as a result of the difficulties inherent in determining market value in the absence of a transaction between a willing buyer and a willing seller. Moreover, inevitable lags occur between changes in market value and changes in property assessment due to the periodic nature of the assessment process.

At the same time, non-uniform assessment may be justified on the basis of horizontal equity. To the extent that property values decline with distance from any well defined centre, other things being equal, horizontal equity dictates increasing effective rates of tax as distance increases. This would require either increasing assessment to value ratios or increasing nominal rax rates as distance from the centre increases.

In any event, assessment inconsistencies should be capitalized into property values. Properties that receive a relatively favourable (unfavourable) assessment, that is their market value is underassessed (overassessed), should sell at a premium (discount) relative to the average. Subsequent to such a sale, removal of the inconsistency would confer a capital loss (gain) on the current owner. As Aaron (1975) notes, any improvement in assessment practices should be expected to generate substantial redistributions among property owners. At the same time, failure to improve assessment practices would simply perpetuate an undesirable situation. Aaron (1975) suggests that a scheme whereby gainers are lump-sum taxed and losers lump-sum compensated in moving to a fairer assessment mechanism may be warranted.

Finally, it should be noted that, given the special treatment of owner occupied housing under the personal income tax, property taxation promotes horizontal equity with regard to the overall tax system. Industrial/commercial property taxes are deductible against income but property taxes on owner-occupied housing are not. Although it has been suggested that property taxes (and mortgage interest) be made deductible in Canada (as is the case in the United States), such a measure would promote horizontal inequity in the Canadian tax system.

4. EFFICIENCY CONSEQUENCES OF THE PROPERTY TAX

Changes in property taxes also have implications for the efficiency of resource allocation. First, and most prominent in the literature, is the excess burden associated with local tax differentials. This results from the reallocation of capital (and, perhaps, other mobile factors such as labour) from relatively high tax jurisdictions to relatively low tax jurisdictions. In a similar vein, international differentials in average tax rates can result in a misallocation of capital between countries. Second, within any tax jurisdiction, intersectoral tax differentials can give rise to a misallocation of both capital and land locally. Third, property taxes may, to the extent that they reduce the net return to capital in the economy, result in a reduction in the accumulation of capital. Fourth, as another form of capital taxation, property taxes may result in intertemporal distortions. At the same time, in the presence of other forms of distortionary capital taxation, property taxes may lessen the severity of intersectoral distortions.

Arnott and MacKinnon (1978) estimate the excess burden of the residential property tax at 16% of revenues collected. This results in particular from the misallocation of land between residential and agricultural use in their model. Hobson (1985) similarly finds the excess burden of both the business and residential property taxes to be relatively high - in the neighbourhood of 25% of revenues collected. This result compounds the Arnott and MacKinnon (1978) misallocation of land from residential to agricultural use with a further misallocation between business and residential use. Sullivan (1984) estimates the deadweight

loss associated with an increase in the business property tax to be an astounding 85% of revenues.

In contrast to the above studies, Devarajan, Fullerton and Musgrave (1980) examine a situation in which the residential property tax is found to be welfare improving. This occurs because they impose the tax in the presence of existing distortions, taking into account the corporate income tax and the treatment of investment income under the personal income tax. Their argument is simple: the introduction of a property tax (modelled as a tax on capital in the housing sector) compensates for the capital market distortion associated with the preferential treatment of owner-occupied housing under current income tax laws. In a second best world, the imposition of a property tax may be welfare improving.

While the Devarajan, Fullerton and Musgrave (1980) argument that, on second-best grounds, the property tax may be welfare improving makes sense in the context of their model, it should be noted that their model is a single period model with no savings. The intertemporal distortion associated with the comprehensive income tax base is frequently cited, and, with this in mind, Hamilton and Whalley (1984) have investigated the impact of removing the property tax in a dynamic sequenced general equilibrium model. They find that this would in fact reduce welfare; the welfare loss associated with the increased intersectoral distortion dominates the welfare gain associated with the reduced intertemporal distortion. Once again, then, the implication is that the property tax is welfare improving on second-best grounds.

5. ADMINISTRATION OF THE PROPERTY TAX

Administration of the property tax involves both assessing the value for tax purposes of the various classes of property which constitute the tax base and determining the rate structure required to generate a given level of revenue. The economic effects of the property tax necessarily hinge on the way in which the tax is administered and in any debate it is important to distinguish between those effects which arise from poor administration of the tax and those which arise from the inherent nature of the tax. Much of the criticism which has been directed at the property tax is in fact a criticism of the way in which the tax has been administered rather than a criticism of the tax per se.

Assessment

The assessed value for tax purposes of a particular property may be other than its market value. For example, commercial property may have an assessed value for tax purposes of 100% of market value, single family residential property may be assessed at 50% of market value and multi-unit residential properties at 75% of market value. Farm property may be assessed at its market value as farmland rather than its free market value. Moreover, true market value can only be determined in the event of an actual transaction between a willing buyer and a willing seller. In the absence of such a transaction, market value must be estimated. This can be done on the basis of comparable sales, depreciated replacement

cost or income capitalization. None of these is any more than an estimate of true market value. Each of these requires considerable information and skill on the part of the individual assigned to the task of estimating true market value. All are subject to error. Finally, frequent re-estimation would be required.

Clayton (1976) summarizes the basic criteria for an assessment system as comprehensiveness, uniformity and openness. Comprehensiveness requires that all property including tax exempt properties such as schools and churches should be assessed. Uniformity requires that all properties are assessed in the same way. Openness requires that property owners should be able to ascertain how their assessment was made and, if appropriate, challenge it. Fundamental to these criteria is the notion of market value assessment. For a summary of the extent to which Canadian municipalities have achieved these criteria see Clayton (1976) and Provincial and Municipal Finances (1983).

Since it is the effective rate of tax on each class of property which ultimately matters in an economic sense, adoption of administrative measures which adhere to the above criteria would considerably simplify the process of determining and comparing effective tax rates within and across property classes. Under such a system, observed tax rate differentials would be meaningful.

Rate Structure

Tax rates are determined by dividing required revenues by the assessed value for tax purposes of all real property. This may involve differential rates on various classes of property. For example, the rate on commercial/industrial property may exceed that on residential property.

The determination of an appropriate rate structure to be applied to the assessed value of taxable property is somewhat problematic. It may be desired to implement a rate structure which reflects the costs of providing a given level of public services. Alternatively, it may be desired to encourage a particular pattern on land use. Or perhaps rates should reflect differences in preferences for publicly provided goods and services. Some would argue that rates should reflect ability to pay. Others would argue that rates should be set so as to minimize the dead-weight loss associated with local taxation.

Along these lines, Bossons (1981) has argued that, to the extent that individuals derive differential benefits, they should pay different amounts in taxes to reflect benefits received. By the same token, Bossons (1981) has argued that property in high density areas should be assessed at a relatively lower percentage of market value than property in low density areas in order to reflect differences in the average cost of providing local services. In either case, non-uniform effective tax rates are called for and such could be achieved through an appropriate rate structure applied to a base assessed at market value.[9]

Bossons (1981) has argued that local governments provide both property related services and people related services and that this distinction is important in determining an appropriate property tax rate structure. In particular, he argues that property taxes paid should reflect the cost of providing property related benefits received. Thus property tax rates should reflect the cost of providing services such as sewer and water, fire and police protection but not such services as education and welfare. This requires relatively higher property tax rates in low density areas than in high density areas. It also implies an increase in transfers to municipalities in order to finance people related services; that is, a reduced reliance on property taxes as a source of local government revenue. Finally, property tax rates should reflect differentials in benefits across classes of property.

The existing split rate system which results in higher effective tax rates on non-residential property is difficult to justify on the basis of any reasonable economic criterion. Viewed as a benefits tax, effective tax rates should be higher on residential rather than non-residential properties since benefits, especially people related benefits, accrue largely to residents not businesses.

On ability to pay grounds, there is no reason to presume that the value of property owned in business is correlated to ability to pay. Given a positive income elasticity of demand for housing services, however, there may be some correlation between the value of residential property owned and ability to pay.

On efficiency grounds, the application of differential tax rates to residential and non-residential properties distorts the allocation of land and capital among alternative uses. This may be desired on second-best grounds given land use externalities. On the other hand, by implicitly shifting the burden of the property tax from residential to industrial/commercial property, the distortionary impact associated with the non-taxation of imputed net rental income and capital gains on owner-occupied housing in the presence of other capital tax distortions may be exacerbated.

Thirsk (1982) has argued that the efficiency costs associated with property taxation would be lowest if tax rates were lower on non-residential property rather than on residential property. Based on the inverse elasticity rule of optimal taxation, to the extent that owners of residential property are relatively less mobile than owners of non-residential property, effective property tax rates should be higher on residential rather than non-residential property.

In a refinement on this theme, Wilson (1985) has demonstrated that the difference between the optimal tax rates on residential and industrial/commercial properties is ambiguous. On the one hand, that housing is relatively capital intensive indicates that a lower relative tax rate on residential property is optimal. On the other hand, a relatively low elasticity of substitution between inputs in housing production indicates that a higher relative tax rate on residential property is optimal. The determination of an optimal set of residential and industrial/commercial property taxes therefore remains an empirical issue. Based on "reasonable" parameter estimates, Wilson (1985) concludes that nonetheless a higher differential tax on residential property is justifiable.

Tax Exporting

An important issue concerns the extent to which the non-residential property tax is shifted to consumers or owners of factors of production residing outside the taxing jurisdiction; that is, the extent to which the burden of the tax can be exported. Tax exporting can occur as a result of an improvement in a local jurisdiction's terms of trade either with other jurisdictions nationally or internationally or both or as a result of a reduction in land rents or capital rents paid to non-resident owners.

Thirsk (1982) makes the important distinction between two types of non-residential property - commercial and industrial property. Commercial property typically provides locally consumed goods and services in contrast to industrial property which typically provides goods and services which are marketed both nationally and internationally. Ballentine and Thirsk (1981) have found that the extent to which jurisdictions in Canada can export the burden of the non-residential property tax is quite significant. Perhaps most striking of all is the implication in Ballentine and Thirsk (1979) that the beneficial terms of trade effect internationally, associated with increases in the non-residential property tax,completely swamps any efficiency costs associated with the differential tax treatment of residential and non-residential property.

Tax exporting may be extremely desirable politically. As a matter of principle, however, tax exporting can only be condoned to the

extent that locally provided goods and services enter the production process. While this may be the case for property related services, it hardly extends to people related services. Once again, it is difficult to justify higher effective tax rates on non-residential property than on residential property.

As a tax on land and capital, uniform property tax rates on residential and non-residential property might be justifiable on efficiency grounds. However, in the presence of other forms of capital taxation such as the corporate income tax and given the non-taxation of net rental income and capital gains on owner-occupied housing, higher differential rates on residential property would appear to promote the goal of efficiency. As a benefits tax, higher differential rates on residential property are also called for. Indeed, as Thirsk (1982) notes, unless the residential property tax reflects benefits received, there will be an incentive to overprovide local public goods and services.

Ballentine and Thirsk (1981) address the implicit inter-jurisdictional income transfers resulting from tax exporting between jurisdictions. Comparison of average income and the tax exporting rate for a variety of communities in Ontario suggests that high income communities enjoy relatively high tax exporting rates; there is an implicit income transfer from low income communities to high income communities. Since any explicit inter-jurisdictional income transfer system in the form of unconditional grants would seek to transfer income from high to low income jurisdictions, the system of implicit income transfers associated with tax exporting may seriously detract from the impact of provincial and federal redistribution programmes.

Ballentine and Thirsk (1981) also assess the deadweight loss due to the overprovision of local public goods and services when part of the tax burden can be exported at somewhere between 35% and 55% per dollar of revenue from the non-residential property tax. Moreover, they estimate the excess burden associated with local differentials in non-residential property tax rates at anywhere from 25% to 55% per dollar of revenue depending on the size of the differential.

Locational Incentives and Tax Competition

Relatively low effective rates of non-residential property tax can be used to provide an incentive for industry to locate within a particular jurisdiction. The potential for property tax competition among jurisdictions is evident and this is often cited as yet another source of inefficiency resulting from property taxation.[10] Yet, to the extent that the location of industry generates employment locally, such inducements may be justified on efficiency grounds in jurisdictions with unemployment. If unemployed workers collect welfare payments supported out of local property tax revenues, then increased local employment lessens the demands being made on the existing property tax base, permitting further rate reductions.

Such tax competition, however, can provide a balance to the problem of tax exporting. In a perfect Tiebout equilibrium, local property tax differentials reflect only benefit differentials and public

goods are provided optimally in all jurisdictions. Central to the establishment of such an equilibrium is active competition among planners for residents - both firms and individuals.

Property tax harmonization among jurisdictions resulting from provincial or federal supervision may be justified in the presence of extensive tax exporting and the associated distributional considerations or in the presence of a serious misallocation of resources due to local rate differentials. It should be noted that harmonization does not call for uniformity of effective tax rates which would eliminate local fiscal autonomy, but rather it simply calls for due consideration of the implications for distribution and efficiency of local differentials.

Summary

To summarize, it is difficult to justify on economic criteria the imposition of higher effective property tax rates on non-residential property compared to those imposed on residential property. Indeed, the literature suggests that the reverse should be the case. However, a substantial reduction in non-residential property tax rates would necessitate a decrease in locally financed expenditures, an increase in grants from higher levels of government, granting municipal governments access to alternative tax bases such as sales and income taxes, increased reliance on the residential property tax or some combination of these.

6. REFORMING THE PROPERTY TAX WITHIN THE EXISTING TAX SYSTEM

Potential Role of the Property Tax

In a perfect Tiebout equilibrium, property taxes serve the role of user charges for benefits received from locally provided goods and services and property tax rate differentials both within and among jurisdictions reflect nothing more than benefits differentials. The present direction for reform of the property tax would seem to be in matching more closely effective tax rates on various classes of property with benefits received. In particular, this suggests that the effective tax rate on residential property should be higher relative to that on non-residential property, placing the cost of financing people related local expenditures squarely on the shoulders of the beneficiaries.

Under existing income tax laws, imputed net rental income and capital gains on owner-occupied housing are exempt from taxation. In the presence of corporate taxes and personal taxes on other forms of capital income, this creates a distortion in favour of investment in owner-occupied housing. The non-deductibility of mortgage interest and property taxes and the absence of any form of capital cost allowance on owner-occupied housing provides a partial offset to this distortion. Given this, it might be argued that the residential property tax tends to equalize the effective rate of tax on capital in Canada regardless of where it is employed. Thus the residential property tax also serves the role of broadening the income tax base.

Also, the residential property tax appears to be, at worst, only mildly regressive. Furthermore, if the existence of property tax credits against provincial income tax is taken into account, the incidence profile tends to proportionality, perhaps even progressivity. So the residential property tax serves the role of redistributing income towards low income groups.

Contrary to received opinion, the property tax may well promote efficiency in resource allocation both interjurisdictionally and intersectorally and also promote both horizontal and vertical equity in the tax system. Many of the perceived problems with the property tax seem to arise more from administrative considerations than from the tax _per se_. Given an ideal administrative structure, the property tax may enhance the existing tax system.

The Present Role of the Property Tax

At present the property tax is the principal revenue source that is solely at the discretion of local governments. Property taxes are levied separately to cover municipal services such as street lighting, garbage collection, road maintenance and police protection and, in most provinces, schooling.[11] In 1980, some 28% of own-source revenues generated by local governments was in the form of school taxes. Approximately 50% of all local government revenues is in the form of grants and transfers from higher levels of government.

In most provinces, the assessment function is now carried out by the provincial government although rates are set at the discretion of local governments. Ostensibly, all provinces adhere to the principle of market value assessment, although, in practice, most are a long way from achieving this goal.

As presently administered, the property tax is far from being a true benefits tax. The trend towards market value assessment has, if anything, moved the system even further from such a role. Discrimination in rates against industrial/commercial property cannot be justified on benefits grounds.

Industrial/commercial property taxes appear to be regressive in their incidence. There is also the problem of tax exporting between jurisdictions. The residential property tax appears to be, at worst, only mildly regressive. Indeed, if the existence of such things as the property tax credit against provincial income tax liability is taken into account, the incidence profile tends to proportionality, even progressivity, even under extreme forward shifting assumptions.

Directions for Reform

Property tax revenues are used to finance both property related expenditures and people related expenditures. While it can be argued that the former category should be financed according to the benefits principle, of taxation, so too it can be argued that the latter category should be financed according to the ability to pay principle of taxation. Given a positive income elasticity of demand for housing services, there may be some correlation between ability to pay and expenditure on housing services. However, the property tax has proved to be a slow growth source of revenue, partly due to assessment lags and partly due to resistance by voters. A better and generally accepted measure of ability to pay is comprehensive income, and it might be argued that local governments should be given access to the income tax base as a source of finance for the average level of people related expenditures. Local expenditure differentials could then be financed out of property tax differentials.

The implementation of full market value assessment should be encouraged. However, a variable rate structure by class of property should be applied to the base, where rates are set to reflect benefits received.

Tax rates on owner-occupied housing might also be adjusted to reflect the second-best nature of the property tax given the tax treatment of investment income under the corporate and personal income taxes.

Alternative Revenue Sources

There would be advantages and disadvantages in granting local governments access to the potentially lucrative income and sales tax bases. This issue is extensively discussed in Kitchen (1984). The primary advantage would be to reduce dependence on the unpopular property tax, especially the residential property tax. Also, although similar in impact to an increase in provincial-municipal transfers, such increases would be automatic rather than at the discretion of the provincial or federal governments as is the case with grants. The primary disadvantage would be the loss of local autonomy, at least if these taxes were piggy-backed onto existing provincial levies. Alternatively, local governments could administer their own income and/or sales taxes, but this would simply compound the equity and efficiency issues associated with these taxes as they currently exist at the federal and provincial levels.[12]

What is of most interest with regard to this proposal is that reducing dependence on the property tax, financed through increased income and sales taxation, would heighten the existing similarity between the Canadian tax system and a consumption or expenditure based system rather than a system based on comprehensive income. Whether or not such a move would be welfare improving is an open question; it would be necessary to determine the implications for the terms of trade, the efficiency cost due to the implied increase in intersectoral distortions and the efficiency gain due to the implied reduction in intertemporal distortions.

Ballentine and Thirsk (1979) have explored the impact on the distribution of income in Canada of a number of revenue preserving tax substitutions. For example, they demonstrate that replacing a portion of the revenues from the non-residential property tax with the proceeds from a higher corporate income tax rate would be neutral with regard to its impact on the distribution of income. In effect, this involves substituting one form of capital taxation for another and although the composition of output in the economy is altered, the distribution of income is unchanged. Alternatively, using the revenues from an increased personal income tax to finance a reduction in residential property tax rates would result in a redistribution in favour of lower income groups. It should be noted, however, that their analysis ignores intertemporal considerations.

Central to the discussion in Denny (1981) and Bird and Slack (1979) is the point that it does not make sense to talk about reforming the property tax without simultaneously considering the system of grants from provincial to municipal governments and, indeed, the fiscal responsibilities of municipal governments.

Transitional Problems

To the extent that existing property tax differentials have been capitalized into property values, any administrative reform that alters effective tax rates may have significant redistributive consequences. An increase in effective tax rates on residential property will be borne by current property owners. Removal of tax differentials prior to capitalization

simply cancels unrealized capital gains or losses. Removal of tax differentials after capitalization, however, does nothing to recapture any capital gains or losses bestowed on previous owners. As Aaron (1975) notes, "...tax reform creates rather than removes inequities if tax differentials have been capitalized and the property sold." Indeed, the paradox of uniformity in effective rates across classes is that, while this is facilitated through frequent sales (ease of assessment), it is made less desirable the greater the extent to which differentials have been capitalized. Aaron (1975) recommends provision for compensation (or penalization) of owners who have benefitted from favourable differentials (or unfavourable differentials) prior to administrative reform.

Denny (1981) notes that in Ontario, the government's own calculations of the redistribution involved in moving to full market value assessment would result in significant increases in the burden on single family residential properties in urban areas.

However, removing the financing of people related services from the property tax base would presumably reduce any implied increase in residential property taxes suggested by the reforms discussed above. That is, it is far from clear that substantial changes would occur in terms of residential property taxes paid. Rather, property taxes paid would more closely reflect the benefits received from property related services. People related services would be financed from the income tax base; to the extent that this tax is progressive, if anything a redistribution in favour of low income groups would be implied by such a restructuring.

Finally, where reform does result in substantial and unwarranted redistributions, compensation might be paid through the use of revenues gained as a result of the elimination of the property tax credit. Properly structured as a benefits tax, the incidence of the property tax would no longer be an issue. The tax credit, introduced in response to the perceived regressivity of the property tax, would no longer be required.

The Property Tax Credit

An important consideration concerns the widespread use of property tax rebates and credits incorporated into provincial tax structures. These programmes have been instituted in response to the criticism that the residential property tax is regressive in its incidence. Yet, as outlined previously, this criticism may not be valid; the property tax, viewed as a tax on capital, is certainly less regressive than has been commonly believed. Given this, the system of property tax credits may be unnecessary. Moreover, increased reliance on the residential property tax will increase credits claimed against personal income tax, reducing the effective tax rate and revenues from that tax.

Site Value Taxation

There has been some interest in changing the tax base from land and reproducible capital employed in real estate to land alone. The site

value taxation proposal has its origins in the belief that the value of land will reflect the value of publicly provided goods and services within the jurisdiction and that land is in fixed supply. Thus the tax is seen as a benefits tax and one that will not distort the allocation of resources in the economy. Moreover, to the extent that the tax is borne by owners of land, this would tend to make the tax more progressive than under the "old" view of property tax incidence. Admittedly, this raises the problem of separating land value from property value, but it has the advantage of taxing away what is in effect unearned income from landowners. This latter aspect is central to the Henry George Theorem.

Feldstein (1978) has argued that such a tax may not in fact be borne only by landowners. Since ownership of land will typically constitute only a fraction of an individual's asset portfolio and since asset market equilibrium requires that net returns equalize across assets, a land tax will induce individuals to invest in relatively more capital and hence drive down the return to capital in the economy as a whole.

Neither is it clear that the assumption of a fixed supply of land is valid. Aside from land reclamation projects, neighbouring agricultural land can frequently be annexed or rezoned. Also, unimproved land can be made ready for development. Whatever the reason, if land has some positive supply elasticity, then it becomes possible to shift some of the burden of the tax.

There has been a lively debate over the past few years as to whether land taxation is neutral; that is, whether or not land taxation

distorts investment decisions. Bentick (1979) and Mills (1981) have argued that land taxation favours projects which yield benefits early on. Wildasin (1982) argues that this result arises because the tax is tied to current values in alternative uses; if instead the tax payments were independent of use, for example, a lump-sum tax per acre, neutrality would be restored.

In any event, the major redistributions which would result from substituting a site value tax for the existing property tax would appear to make it politically infeasible.

Summary

In summary, the residential property tax appears to be less regressive than is commonly believed and may be welfare improving. Indeed, at present, the residential property tax may be underutilized as a local revenue source. The non-residential property tax, however, appears to have undesirable redistributive consequences and may be quite distortionary. The literature endorses increased reliance on residential property taxes to reflect the costs of providing property related services at the local level. Effective rates of property tax on non-residential property should be reduced to reflect only property related benefits received. As a result of tax competition and tax exporting, this tax should either be eliminated or administered by a higher level of government. People related services should be financed out of the income tax base. Harmonization would be facilitated through global use of full market value assessment. Differentials in effective tax rates could then be achieved through manipulation of rates only. Redistributions resulting from reform may require compensatory payments or charges through the transition period.

7. POTENTIAL ROLE FOR THE PROPERTY TAX IN A REFORMED TAX SYSTEM

Existing income based taxes in Canada have been criticized as being inequitable and promoting an inefficient allocation. One proposal for reform would involve moving to an expenditure or consumption base. Indeed, the existing Canadian income tax base is frequently cited as being a hybrid of a comprehensive income tax and a pure expenditure tax or a pure consumption tax, especially in view of the tax treatment of owner-occupied housing. Any reform, either designed to move the income tax base closer to the Haig-Simons-Carter base or to move explicitly to an expenditure or consumption base would necessarily involve simultaneously reforming the property tax and it is to this issue that this section is addressed.

In the previous section, it was stressed that the non-deductibility of expenses including property taxes on owner-occupied housing tends to mitigate the uneven treatment of capital income under existing tax laws in Canada. As such, the property tax may promote both equity and efficiency and, indeed, may be underutilized in this regard. At the same time, since non-deductibility of property taxes on owner-occupied housing effectively broadens the income tax base, the intertemporal misallocation of resources is promoted. Nonetheless, work by Hamilton and Whalley (1984) suggests that the intersectoral aspect dominates the intertemporal aspect; elimination of the property tax in their model would be detrimental to welfare.

What has not been emphasized previously is that moving to either a pure income tax or a pure expenditure tax would be welfare improving

relative to the present hybrid system. Hamilton and Whalley (1984) indicate that either move would involve significant improvements in welfare resulting from the elimination of intersectoral distortions. This runs counter to the conventional wisdom which emphasizes the intertemporal distortion associated with broader based income taxation and the view that, given the hybrid nature of the existing tax system, a substantial portion of the welfare gains from moving to a consumption tax system may already have been achieved. One implication of this is that further increases in the effective property tax rate on owner-occupied housing may be welfare improving.

Moving to a pure income tax would involve, among other things, incorporating imputed net rental income on owner-occupied housing into the tax base. Disregarding the problems associated with the imputation of net rental income, if this were done, the role of the property tax as a "second best" tax would be eliminated. Instead, the only potential role for the property tax would be as a benefits related tax used to finance local differentials in the provision of public goods and services.

Similarly, if a move to a pure consumption tax were made, the resulting elimination of existing capital tax distortions would render the only defensible role for the property tax to be that of a benefits related tax as described above.

In both cases, then, reform of the existing tax system would involve an adjustment in the existing rate structure imposed on real property such that taxes paid would more closely reflect benefits differentials received. To the extent that this implies a reallocation of the burden from industrial/commercial property to residential property,

the direction for reform of the property tax is the same whether the existing tax system is maintained, a broader based income tax is adopted or a consumption tax is substituted for the existing system.

In all this, it should not be forgotten that, to the extent that some portion of the burden of the property tax is shifted to foreigners either through higher commodity prices or through lower net returns to foreign owned factors employed in Canada, reform of the tax system which includes relegating the property tax to the status of a pure benefits tax will have an impact on the ability of Canadians to export the burden of taxation. Further work is required in investigating this important issue. What can be said, however, is that, to the extent that some portion of the burden of the property tax is currently exported to foreigners, property tax reform as discussed above will necessarily result in Canadians shouldering a greater portion of the tax burden.

8. SUMMARY AND POLICY RECOMMENDATIONS

This paper has attempted to draw together the various strands of literature on property taxation with a view to assessing its incidence and effect on efficiency in an open economy. In so doing, due reference has been made to the overall tax structure, especially taxes on capital. The conclusions are not new, at least within academic circles. In particular, it is argued that the property tax is not as regressive as is commonly belived and may be welfare improving. Many of the positive features associated with property taxation are not widely recognized or understood. Also, much of the criticism that is commonly directed at the property tax, while valid, has more to do with the administration of the tax than the tax per se. The primary motivation of the paper has been to elucidate these points, in the hope that a more enlightened debate on the role of the property tax will ensue. This is particularly relevant given the current interest in tax reform.

At the outset, the property tax, as it is currently administered, was shown to belong squarely within the class of capital taxes and to be an integral part of the existing capital tax system. As such, an examination of the property tax is central to any evaluation of capital taxation.

A number of important issues were highlighted. It was argued that it is important to distinguish between industrial/commercial property taxes and residential property taxes. There is a greater

potential for exporting the burden of industrial/commercial property taxes and, also, these taxes may be more distortionary than residential taxes. Tax exporting can arise as a result of a change in the terms of trade between jurisdictions nationally and/or internationally. It can also arise as a result of changes in factor prices that impact on non-resident factor owners. There is some evidence that suggests that the potential for exporting the burden of industrial/commercial property taxes internationally outweighs any efficiency costs associated with such taxes. On these grounds alone, industrial/commercial property taxes may be welfare improving (domestically).

It was also noted that net imputed rental income and capital gains on owner-occupied housing are exempt from taxation under existing personal income tax laws in Canada. This creates a distortion in favour of investment in owner-occupied housing. Since mortgage interest, property taxes and capital costs on owner-occupied housing are not deductible against income, this distortion is, at least partially, offset. Property taxation, in effect, moves the existing tax system closer to a comprehensive income tax base. Thus, the residential property tax tends to even out effective tax rates on capital, lessening the intersectoral distoriton. At the same time, moving the tax system closer to a comprehensive income tax base increases the intertemporal distortion. There is some evidence that the former effect may dominate the latter, in which case, the residential property tax would be welfare improving.

The appropriate role for the property tax was also discussed. In a perfect Tiebout equilibrium, local differentials in levels of public goods and services are financed through property tax differentials. In effect, property taxes become exact user charges and local public goods and services are provided optimally in all jurisdictions. Central to the establishment of such an equilibrium is the notion of active competition among jurisdictions for residents - both firms and individuals. That property taxes should more closely resemble benefits taxes is a central theme in the literature. Bringing this about would involve a fundamental restructuring in the existing system of local finance.

At present, effective tax rates on industrial/commercial properties exceed those on residential properties. Yet many of the benefits of local public services accrue primarily to residential property, given the distinction between property related services and people related services. There is an argument in the literature that property related services should be financed based on the benefits principle of taxation while people related services should be financed based on the ability to pay principle of taxation. This suggests that effective tax rates should be restructured, placing more emphasis on the

residential property tax, increasing intergovernmental grants financed out of income tax revenues or giving local governments direct access to the income tax base. At the same time, industrial/commercial tax rates should be reduced to more closely reflect benefits received.

There is another argument in favour of a relative reduction in industrial/commercial property tax rates, drawn from the literature on optimal taxation. Since busines capital tends to be more mobile than residential capital, the inverse elasticity rule suggests that residential tax rates should exceed industrial/commercial tax rates.

With regard to administration of the tax, it was argued that many of the perceived problems with the property tax arise from inconsistencies in assessment practices both within jurisdictions and between jurisdictions. To be sure, mobility of firms and individuals should result in such inconsistencies being capitalized into property values, creating capital gains/losses for owners at the moment of capitalization. Elimination of these inconsistencies would cause further redistributions but of a once only nature that could be compensated for through appropriate lum-sum taxes/subsidies. Continued improvement in assessment practices is called for to minimize the further generation of such redistributions.

The trend to provincial administration of the assessment function should be a good thing in this regard. Also, more frequent assessment would be useful. Most important, all property should be assessed at full market value (or at some constant fraction of market value) including properties that are currently tax exempt and farmland. To the extent that property tax relief may be desired for certain classes of property, this should be accomplished through direct subsidies.

Local autonomy in setting rates should be preserved. To the extent that rate differentials, properly structured, reflect benefits differentials, such differentials are desirable given a Tiebout-type mechanism. One way of reducing pressure on local government finances is to hand over responsibility for certain activities to higher levels of government. While this may be appropriate in the case of welfare payments, for example, it is inappropriate for other activities which characterize the fundamental, in a Tiebout sense, differences between jurisdictions. Eliminating jurisdictional autonomy through too much intervention by higher levels of government would arguably be detrimental to welfare.

With regard to tax incidence, it was argued that, viewed as a capital tax, the existing property tax is less regressive than is commonly believed. Progressivity is also implied if incidence is measured against life-time income rather than current income. Depending on the degree of progressivity desired in the overall tax system, the existing use of property tax credits may be excessive. Moreover any increase in effective residential property tax rates will result in increased credits claimed against provincial income taxes, further straining that revenue source.

In conclusion, the charges that the property tax is both inefficient and inequitable have not been substantiated. Indeed, the counter-claim that, properly structured and administered, the property tax can play a valuable role in any tax system, either income based or expenditure based, appears to be quite defensible.

Technical Appendix A

Consider an economy in which there are N+1 independent tax jurisdictions, j=1,...,N, N+1. In each jurisdiction, housing services are produced according to some linear homogeneous production function, identical across jurisdictions, using capital (K) and land (T) as inputs:

$$H_j^S = h_j^S(K_j, T)$$

Assume T is fixed and normalize units such that T=1. Then

$$H_j^S = h_j^S(K_j)$$

Housing demand is given by

$$H_j^D = h_j^D(P_j)R_j$$

where P_j is housing rental in jurisdiction j and R_j is population in jurisdiction j.

In each jurisdiction, housing market equilibrium requires that

$$h_j^D(P_j)R_j = h_j^S(K_j)$$

Totally differentiate this and, after some manipulation, get

$$(\eta - E)\hat{P}_j = -f_K \hat{K}_j \qquad (1)$$

where

$$\eta = -\frac{dh_j^D}{dP_j}\frac{P_j}{h_j^D}$$

$$E = \frac{dR_j}{dP_j}\frac{P_j}{R_j}$$

and a "^" over a variable denotes a proportionate change. η represents the own-price elasticity of demand for housing. E represents the elasticity of population with respect to housing rental in any jurisdiction and will be permitted to assume values of either zero or infinity.

In the presence of a uniform tax on land and capital at rate t_j, the unit cost function for housing is

$$P_j = c(P_K, P_{Tj})(1 + t_j)$$

where P_K is the net rental on capital and P_{Tj} is the net rental on land in jurisdiction j. Totally differentiate this and, after some manipulation, get

$$\hat{P}_j = f_K \hat{P}_K + f_T \hat{P}_{Tj} + dt_j \qquad (2)$$

where f_K and f_T are the revenue shares of capital and land respectively.

From the definition of σ, the elasticity of substitution, get

$$\hat{K}_j = \sigma(\hat{P}_{Tj} - \hat{P}_K) \qquad (3)$$

Substitute (2) and (3) in (1) to get

$$\hat{P}_{Tj} = \frac{-(\eta-E)}{f_T(\eta-E) + f_K\sigma}dt_j - \frac{f_K[(\eta-E) - \sigma]}{f_T(\eta-E) + f_K\sigma}\hat{P}_K \qquad (4)$$

It is possible to solve for $\hat{P}_K$ through an examination of the capital market equilibrium condition which requires that the net return to capital be equalized across jurisdictions. Denote the first jurisdiction, j=1, as type A and the remaining N jurisdictions as type B. Equilibrium requires that

$$P_A F_A'(1 + t_A)^{-1} = P_B F_B'(1 + t_B)^{-1}$$

Totally differentiate this. Note that $K_A = K_B$ and that full employment requires

$$K_A + NK_B = \bar{K}$$

Thus

$$dK_B = -\frac{1}{N}dK_A$$

and

$$F''_A = F''_B$$

Also assume that in the initial situation $t_A = t_B$. In turn this implies $P_A = P_B$. After some manipulation get

$$\hat{P}_K = \left(\frac{N}{N+1}\right)(dt_A - dt_B) \qquad (5)$$

where $\hat{P}$ denotes the gross rental on capital. From this it follows that

$$\hat{P}_K = \hat{P}_K - dt_A = -\left(\frac{N dt_B + dt_A}{N+1}\right) \qquad (6)$$

Define

$$dt^{AV} = \frac{(N dt_B + dt_A)}{N+1}$$

This is Mieszkowski's (1972) average rate of tax. Equation (6) states that the net return to capital falls by the average rate of tax across jurisdictions.

Finally, substitute (6) back into (4) to get

$$\hat{P}_{Tj} = -dt^{AV} + \frac{(\eta - E)}{f_T(\eta - E) + f_K \sigma}\left(dt^{AV} - dt_j\right) \qquad (7)$$

A number of special cases are of interest in the context of the existing literature on property tax incidence. As is shown below, however, they all point to the same conclusion: that the real burden of the property tax falls on owners of land and capital in the economy.

Case a: Uniform taxes in all jurisdictions.

If $dt_A = dt_B$, then property taxes are identical to a set of general factor taxes on factors in fixed supply. Hence

$$\hat{P}_K = -dt_A$$

$$\hat{P}_{Tj} = -dt_A$$

Case b: Differential tax rates.

Assume $dt_A > 0$, $dt_B = 0$ and $N = \infty$. This represents the case in which a tax increase occurs in a single jurisdiction that is small relative to the rest of the economy. In this case

$$\hat{P}_K = 0$$

since $$\lim_{N\to\infty} \frac{dt_A}{N+1} = 0$$

$$\hat{P}_{TA} = \frac{-(\eta-E)}{f_T(\eta-E) + f_K\sigma}\, dt_A$$

and $$\hat{P}_{TB} = 0$$

Further assume that E=0 (immobile population). Then, if $\eta=\sigma$,

$$\hat{P}_{TA} = -dt_A$$

which states that the burden on land in jurisdiction A will be exactly the amount of tax assessed on land. Since $\hat{P}_K = 0$, the full amount of tax assessed on capital is forward shifted through an increase in housing rentals.

If $\eta > \sigma$, the burden on land exceeds the amount of tax assessed on land; part of the burden of the tax assessed on capital is laterally shifted to land which implies that less than the full amount of tax on capital is forward shifted.

As Bradford (1978) has demonstrated, however, the assumption that a small jurisdiction faces a fixed net rental on capital does not imply that an

outmigration of capital from such a jurisdiction will leave the net return to capital as a whole unaltered. Following Mieszkowski and Zodrow (1985), the effect of a tax change in a single jurisdiction on the net return to capital as a whole is given by

$$\hat{KP}_K = -(N-1)K_A \frac{dt_A}{N+1} = -K_A dt_A$$

which states that the net return to capital as a whole falls by the amount of tax assessed on capital in the taxing jurisdiction.

Moreover, summing the changes in net land rentals across jurisdictions results in (using (4))

$$\sum_{j=1}^{N+1} \hat{P}_{Tj} = \frac{-n}{f_K+n+f_K\sigma_K} dt_A + \frac{f_K(n-\sigma_K)}{f_K+n+f_K\sigma_K} \frac{dt_A}{N+1} + N \frac{f_K(n-\sigma_K)}{f_K+n+f_K\sigma_K} \frac{dt_A}{N+1}$$

$$= \frac{-n + (1-f_T)n - f_K\sigma_K}{f_K+n+f_K\sigma_K} dt_A = -dt_A$$

which implies Mieszkowski and Zodsow's (1985) assertion that capitalization effects are relative rather than absolute. By a similar line of argument, the "excise" effects of the tax cancel across jurisdictions. Thus, the real burden of the property tax is on owners of land and capital in the economy as a whole.

Alternatively, assume that $E=\infty$ (perfectly mobile population). In this case,

$$\hat{P}_{TA} = \frac{-1}{f_T} dt_A$$

which states that the full amount of tax increase is capitalized into land rents. Once again, however, summing across jurisdictions to determine the effect on net factor returns results in

$$\hat{KP}_K = -K_A \, dt_A$$

$$\sum_{j=1}^{N+1} \hat{P}_{Tj} = -dt_A$$

The real burden of the tax falls on owners of land and capital as a whole; capitalization is relative rather than absolute.

Case c: Open economy considerations.

Consider a uniform tax change across jurisdictions in a small open economy. As such, $\hat{P}_K$ is given and capital (but not land) is internationally mobile. This is precisely case b above with E=0. The burden on (domestic) landowners hinges on the relationship between η and σ. If $\eta > \sigma$, the burden on owners of land in the taxing jurisdiction exceeds the amount of tax assessed on land. Owners of foreign land are made correspondingly better off. The real burden falls on owners of land in the taxing jurisdiction and capital owners as a whole. To the extent that there is foreign ownership, some portion of the burden is exported.

Technical Appendix B

Suppose local public services (G) are public purchases of the composite good (H) (publicly provided private goods). Provision of G is financed through a non-distorting land tax at rate h and a tax levied on capital at rate t such that

$$G = tP_K K + hP_T T \qquad (1)$$

Residents of each jurisdiction own equal shares in the jurisdiction's land and an equal share in the national capital stock. Capital is not necessarily employed in the jurisdiction of residence. Population of each jurisdiction is normalized to equal 1.

In each jurisdiction, consumption net of public services is given by

$$C = F(K) - P_K K + \frac{P_K \bar{K}}{N+1} - tP_K K - hP_T T \qquad (2)$$

where $P_K \bar{K} / (N+1)$ is the jurisdiction's share of the national capital stock.

Each local government seeks to maximize

$$U(C,G)$$

Making use of (1) and (2), the decision problem is

$$\underset{\{t,h\}}{\text{Max}} \; U(F(K) - P_K K + \frac{P_K \bar{K}}{N+1} - tP_K K - hP_T T, tP_K K + hP_T T)$$

First order conditions for this problem are

$$U_1 \; (F'(K)\frac{dK}{dt} - P_K\frac{dK}{dt} - tP_K\frac{dK}{dt} - P_K K) + U_2 \; (tP_K\frac{dK}{dt} + P_K K) \doteq 0$$

$$- U_1 P_T T + U_2 P_T T = 0$$

Perfectly competitive firms set

$$F'(K) = P_K(1+t)$$

The first order conditions can therefore be simplified to read

$$\frac{U_2}{U_1} = 1/\{1 - (T\phi/K)\}$$

where $\phi = \frac{-dK}{dt}$

and $\frac{U_2}{U_1} = 1$

If there were no constraint on non-distorting taxes, the optimal tax on capital would be zero and public services would be financed entirely through the land tax. But since revenues from the land tax cannot exceed land's share in output, this constrains G. The optimal provision of G is where the marginal rate of substitution equals the

marginal rate of transformation.

If distortionary capital taxes must be used, then

$$\frac{U_1}{U_2} > 1$$

since

$$\phi = \frac{-dK}{dt} = \frac{-1}{F''} > 0$$

which implies that public services will be provided at a level below the optimum.

Where distortionary capital taxes are employed, the after tax return to capital in the economy as a whole falls by the amount of tax levied in the taxing jurisdiction as shown previously. Notice that the property tax is equivalent to a head tax in the special case where $\eta = 0$ (which is equivalent to precise zoning). In this special case, the property tax is a pure benefits tax and has no distortionary impact.

Technical Appendix C

Consider a two country model with international capital flows, representing Canada and the United States. Assume the following:

(i) Canada is an importer of capital from the U.S.

(ii) the corporate tax rate in Canada is below that in the U.S.

(iii) under international tax treaties home country tax credit is given against any corporate taxes hard in the host country and property taxes hard in the host country are deductible against income as a business expense.

(iv) all foreign earnings are instantaneously repatriated.

Given that property taxes are deductible against corporate income, there are three net rental rates on capital that are of interest. These are the net rental on

(a) U.S. owned capital employed in Canada

$$P_K^f = \bar{P}_K - \bar{P}_K t_K - (1-t_K)\bar{P}_K t_C^* \qquad (1)$$

(b) U.S. capital employed domestically

$$P_K^* = \bar{P}_K^* - \bar{P}_K^* t_K^* - (1-t_K^*)\bar{P}_K^* t_C^* \qquad (2)$$

(c) Canadian capital employed domestically

$$P_K = \bar{P}_K - \bar{P}_K t_K - (1-t_K)\bar{P}_K t_C \qquad (3)$$

where $\bar{P}_K$ denotes the gross rental on capital in Canada, t_K denotes the Canadian property tax rate and t_C denotes the Canadian corporate tax rate.

The same variables superscripted with a * represent the U.S. values. Note that in (a) it is recognized that the effective rate of corporate tax on U.S. capital employed in Canada is the home country rate (given assumptions (ii) to (iv)).

In equilibrium, the net return to U.S. capital should be the same regardless of whether it is employed abroad or domestically

$$P_{Kf} = P^{*}_{K}$$

which requires that

$$\bar{P}_{K}(1-t_{K})(1-t^{*}_{C}) = \bar{P}^{*}_{K}(1-t^{*}_{K})(1-t^{*}_{C})$$

which is the same as

$$\bar{P}_{K}(1-t_{K}) = \bar{P}^{*}_{K}(1-t^{*}_{K})$$

This states that the gross return to capital net of property taxes should be the same abroad as it is domestically. From this, it follows that

(i) if $t_{K} < t^{*}_{K}$, then $\bar{P}_{K} < \bar{P}^{*}_{K}$

(ii) if $t_{K} = t^{*}_{K}$, then $\bar{P}_{K} = \bar{P}^{*}_{K}$

(iii) if $t_{K} > t^{*}_{K}$, then $\bar{P}_{K} > P^{*}_{K}$

As a small open economy, Canada takes $\bar{P}^{*}_{K}(1-t^{*}_{K})$ as given. Therefore,

equations (1) to (3) can be rewritten as

$$P_K^f = P_K^* (1-t_K^*)(1-t_C^*)$$

$$P_K^* = P_K^* (1-t_K^*)(1-t_C^*)$$

$$P_K = P_K^* (1-t_K^*)(1-t_C)$$

Since, by assumption (i), $t_C < t_C^*$, it follows that

$$P_K^f = P_K^* < P_K$$

As a special case, if $t_C = t_C^*$, then $P_K^f = P_K^* = P_K$ which corresponds to the formulation in Bird (1976).

A number of results follow from this formulation some of which have been examined in Ballentine and Thirsk (1979). The first is quite familiar. Any increase in the Canadian corporate tax rate which leaves $\bar{P}_K$ unchanged simply effects a transfer from the U.S. treasury to the Canadian treasury. The quantity of U.S. capital employed in Canada is unaffected. If $\bar{P}_K$ uses as a result of an increase in t_C, there will be an inflow of capital from the U.S. until $\bar{P}_K(1-t_K)$ again equals $\bar{P}_K^*(1-t_K^*)$.

On the other hand, an increase in the U.S. property tax rate will be reflected in a fall in P_K^*, $\bar{P}_K^*$ unchanged. Since $\bar{P}_K^*(1-t_K^*)$ therefore falls, an inflow of U.S. capital to Canada is induced, reducing $\bar{P}_K$.

NOTES

[1] One of the major directions in property tax reform over the past decade has been provincial administration of property assessment. However, differences in assessments of various classes of properties, both within and between provinces, nonetheless render comparisons of nominal rates difficult to interpret.

[2] This would be the case given constant returns to scale technology and perfect competition.

[3] Consideration of income taxation and depreciation would not alter the argument being made here.

[4] Models of this type can be found in Dahlby (1981), Hobson (1985), and Wildasin (1985). See also Mieszkowski and Zodrow (1985).

[5] For a fuller discussion of this, see Aaron (1975) pp. 31-34.

[6] See Aaron (1975) pp. 29-32 for a discussion of this point.

[7] See Gaffney (1971) for a discussion of this point.

[8] Here horizontal equity is measured on the basis of current income, as is conventional. However, in the context of property taxation, horizontal equity may be measured on the basis of property holdings. The two measures will typically give inconsistent results.

[9] Bossons (1981) argues that variable assessment ratios combined with uniform rate would be called for. In terms of effective rates, the outcome would be the same.

[10] In Ontario and other provinces, municipalities are not permitted to enter into overt competition, tax or otherwise, in attracting industry. Prior to provincial involvement in assessment, covert competition was easy. Even now, rate structures can be adapted to induce industry to locate in particular jurisdictions.

[11] In New Brunswick, school finance is wholly the responsibility of the province.

[12] See Kitchen (1984) and Kitchen and McMillan (1985) for a discussion of these points.

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